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Illinois U Library

The
IRON AGE

AUGUST 5, 1948

New Departure Sealed-for-life Ball Bearings help make your home appliances "Lubricated for life"

Because they keep dirt out and grease in, these bearings make home appliances work better . . . last longer. Ask for Booklet "Sealed."

Sealed and "Lubricated for life" Ball Bearings
Originated, developed and –
Built to be forgotten by
NEW DEPARTURE
nothing rolls like a ball...
NEW DEPARTURE • Division of GENERAL MOTORS • BRISTOL, CONNECTICUT

ARE YOU TEEING OFF WITH A PUTTER?

RIDICULOUS, isn't it! But no more ridiculous than trying to get production efficiency with the wrong crane!

Plant conditions change. Products and production methods change. The crane that may have fitted the job perfectly a few years ago may be entirely inappropriate for your present materials-handling needs.

Experienced Whiting Crane Engineers are qualified by experience to analyze your individual plant conditions and advise whether rehabilitation or replacement of your present crane equipment is desirable for over-all materials-handling economy. They are experts in analyzing—then designing and building cranes to meet individual plant requirements.

ANNOUNCEMENT

Whiting has acquired the patents, manufacturing and sales rights to Spencer & Morris Tramrail Systems. These combined with Whiting Hoists, Light Cranes, and Heavy Cranes enable Whiting to supply a complete, fully integrated overhead materials-handling system.

WHITING CORPORATION
15601 Lathrop Ave. Harvey, Illinois

Offices in Chicago, Cincinnati, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, and St. Louis. Agents in other principal cities. Canadian Subsidiary: Whiting Corporation (Canada) Ltd., Toronto, Ontario. Export Department: 30 Church St., New York 7, N. Y.

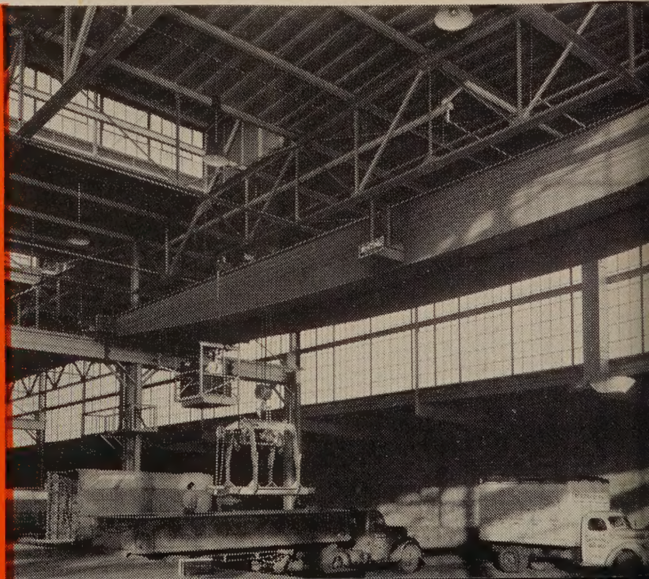
Dependable ·· Quiet-Running ·· Durable

WHITING

Overhead Traveling CRANES

BUILDERS OF QUALITY CRANES

FOR OVER 60 YEARS



. then you
d a pinch
thyme

There's an element of art in every business. The skills of the steel craft, shared and advanced through neighborly cooperation, have brought Barium customers the best possible steel and steel products.

Consider the advantages of Barium's coordinated facilities for melting, rolling, casting, forging, stamping, machining and fabricating the steel used in your products. All of us in the Barium corporate neighborhood are ready to do our part in the often complex job of procuring and processing the steel you specify.

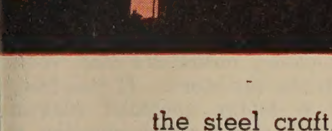
Get acquainted with the Barium subsidiary which can best advise you on your problems and supply your needs.

WE MELT, ROLL, CAST, FORGE, STAMP, MACHINE AND FABRICATE STEEL

Barium
STEEL CORPORATION
STEELWRIGHT TO THE NATION

ONE OF THE 16 BARIUM GOOD NEIGHBORS

E GEOMETRIC STAMPING COMPANY
VELAND, OHIO
iary of Barium Steel Corporation



Leading producer of medium and heavy metal stampings and assemblies. Geometric craftsmanship has served stamping users for over 30 years. Large modern plant has presses of 40 to 450 ton capacity . . . complete facilities in metal fabrication and welding . . . tool and die design and construction . . . engineering and redesigning.

BARIUM STEEL CORPORATION

EXECUTIVE OFFICES
25 BROAD ST., NEW YORK, N. Y.

AMERICAN STEEL TRACTOR CORP., *Canton, Ohio* • CLYDE IRON WORKS, INC., *Duluth, Minn.* • CENTRAL IRON AND STEEL COMPANY., *Harrisburg, Pa.* BARIUM STEEL & FORGE, INC., *Canton, Ohio* • BARIUM EQUIPMENT CORP., BARIUM STEEL EXPORT, INC. • BAYONNE BOLT CORP., *Bayonne, N. J.* THE CUYAHOGA SPRING COMPANY, *Cleveland, Ohio* • THE GEOMETRIC STAMPING COMPANY, *Cleveland, Ohio* • PERMA-JACK CORP., *Cleveland, Ohio* PORCELAIN STEELS CORP., *Cleveland, Ohio* • THE DETROIT STEEL CASTING COMPANY, *Detroit, Mich.* • SHEFFIELD IRON & STEEL CO., *Sheffield, Ala.* KERMATH MANUFACTURING COMPANY, *Detroit, Mich.* • KERMATH (CANADA) LTD., *Toronto, Ontario, Canada* • REPUBLIC INDUSTRIES, INC., *N. Y.* GLOBE FORGE, INC., *Syracuse, N.Y.* • ERIE BOLT & NUT COMPANY, *Erie, Pa.* • WILEY MANUFACTURING COMPANY, *Mountville, Pa., and Port Deposit, Md.*

facts speak LOUDEST

At least one type of Molybdenum high speed steel is listed and promoted on a basis of equivalent and interchangeable performance with tungsten steel, by makers of high speed steel.

Users' reports of Molybdenum high speed tools *everywhere* indicate that performance at least equals and in many cases betters that of tungsten tools.

The heat treatment of Molybdenum high speed steels is basically the same as that of tungsten steels. There is nothing in the treatment to confound those who are familiar with the heat treatment of tungsten types.

Molybdenum high speed steels save money in production—for proof send for our FREE booklet.

Climax Molybdenum Company
500 Fifth Avenue • New York City

MAIL THIS COUPON

Please send me a copy
of your FREE BOOKLET

Name ....

Company ....

Address ....

MOLY

HS.2

Fatigue Cracks

BY C. T. POST

A Noisy Noise Annoys

• • You can depend on it that the members of your favorite family journal's brains department keep their thinking machines revved up to a high pitch even during off-duty hours. D. I. Brown, who recently annexed Texas to the Chicago editorial district, is a case in point.

It wasn't just a case of getting wound up tight originally with Brownie. His brain mechanism works like a self-winding wrist watch, so that instead of slowing down eventually like most men's his mental energy is kept constantly at top pitch by its own expended action.

Instead of coming home dog-tired, Brownie bounced into the house one evening a few months ago, announced to his wife that the furniture would have to be cleared from the entire north end of the living room as he was going to construct a scientifically designed studio for the reproduction of sound. Radio, records, home recordings—the works. We'd be jeopardizing the future of some of the most promising engineers within a radius of 100 miles of Chicago if we told how much of their respective companies' time was spent laying the job out. Eventually, though, the time came to buy the equipment. The loud speaker selected was the best, a 15 in. diameter permanent magnet high fidelity model that would handle practically the full range of audible sound.

Leaving nothing to chance, D.I. had to test it. He borrowed what the engineers call a frequency record to play on the phonograph. The record had on it different cycles of sound from 50 to 10,000, constant amplitude of 10 kilocycles, all modulated. To his amazement, Brownie found he could hear only cycles of sound below 4000. He blew up, thought the speaker people had sold him a turkey. But when the little woman breezed in from the bridge party, he played the record for her. She clearly heard all the frequencies right up to 10,000.

For a few minutes—probably the only minutes of his life—Brownie's mental springs ran down. So he had impaired hearing! He felt sick all over. Perhaps his entire auditory system was going bad. Maybe he would have to buy an ear trumpet.

Fortunately, some of his neighborhood cronies dropped in just then. He trembled as he started the frequency record for them. And his relief was intense when several could not hear above 5000 cycles. After that, he tried the record on everybody he could corral. Many men drew blanks above 5000 cycles; most women could hear the 10,000 cycle sound. Dogs, we are told, are good for 20,000 cycles.

The moral, Brownie says, is to get yourself tested before you buy high fidelity radio equipment or a talking dog.

Bis

• • Columbia is putting out a new Vinylite record that plays 24 and without needle scratch. They've played one 1000 times without wearing off the music at all. On this basis, a real "Nature Boy" fan could have a few thousand playings with no rustling to mar its mournful strains. But we'll bet Columbia ducks responsibility for the listener's sanity.

Barge Shipment

• • Steel users who plan to investigate the possibility of barge shipment, now that they have to pay the freight, will be interested to know that one of Monsanto's customers is making a sectional plastic canal, miniature size, soon to be in the toy stores. If you like, there's a motor operated plastic circulating pump which supplies a constant current. Extra equipment includes locks, just like Gatun, and dry docks. The entire system can be electrified for remote control operation.

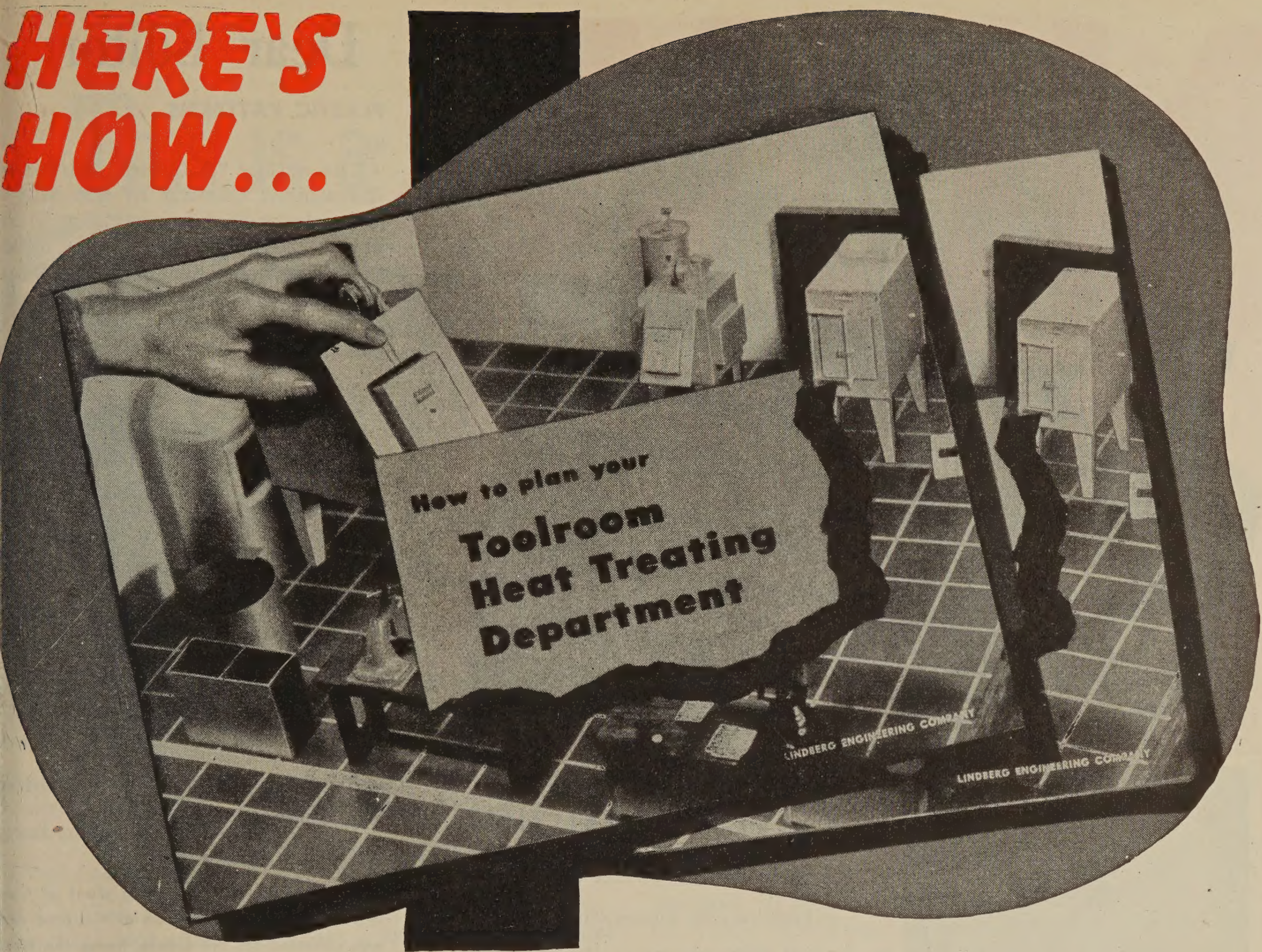
Naturally there are plastic boats and barges. Companies who plan to use the set for pilot tests on their steel hauling operations will have to see Monsanto about getting some plastic steel.

If you're thinking of getting one for Junior to use in his play room, don't worry about the living room ceiling. He can operate it all without spilling, directing river traffic at will. At least that's what Monsanto says in its announcement. But that we have to see.

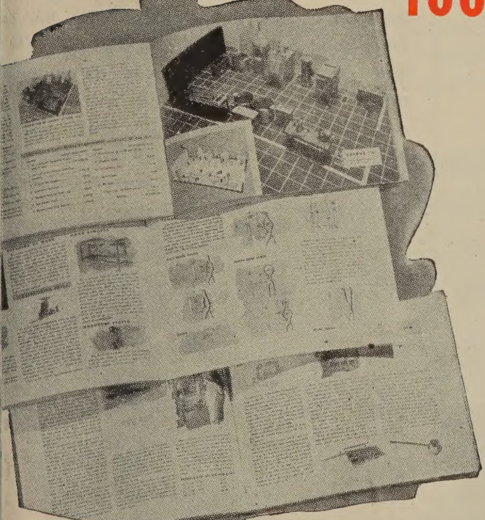
Noisy Names

• • For sheer tympanic effect, we have a suggestion that some means be discovered to form a firm comprising Benjamin Wham, Chicago attorney; Cyrus Ching, the federal mediator; and William Ong, American Steel & Wire's Peerless Public relations man. Wham, Ching and Ong could set up shop at Honger Bay, Calif., notable for a recent natural gas discovery.

HERE'S HOW...



TO PLAN YOUR TOOLROOM HEAT TREATING DEPARTMENT



Published to assist those planning new or expanded heat treating departments. It's yours for the asking.

Material contained in this 24 page booklet, prepared by the Lindberg Engineering Company, is based upon years of experience in helping design hundreds of toolrooms . . . plus additional information gained from the 24-hour-a-day operating experiences of the toolroom heat treating department of the Lindberg Steel Treating Company, the world's largest.

It helps arrive at total costs in advance • Shows recommended department layouts • Tells how to select furnaces of proper size • Gives prices of auxiliary equipment such as tongs, quench tanks, straightening presses, hardness testers, work benches, etc. • Contains loose template pages of furnaces, quench tanks, etc. and graph paper . . . a few seconds of scissor work shows you how your department will look.

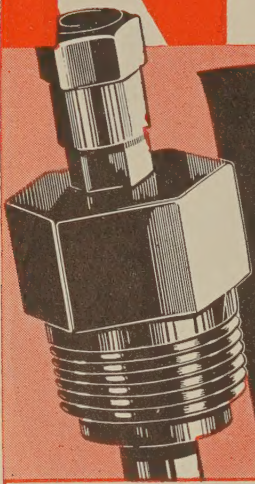
To get your copy write or call your nearest Lindberg Engineering Company office or the Lindberg home office at 2452 West Hubbard Street, Chicago 12, Illinois.

HEAT TREATING Hints
FILMS
FILMS

Other helps for Heat Treaters. "Heat Treating Hints"—a publication covering the practical side of heat treating with strictly "how to do it" articles. Available on request.

"Heat Treating Hints", two movies, (color and sound) bring to the screen practical articles from the printed "Heat Treating Hints". Ideal for technical associations, plant showings, schools. Write for Bookings.

LINDBERG FURNACES

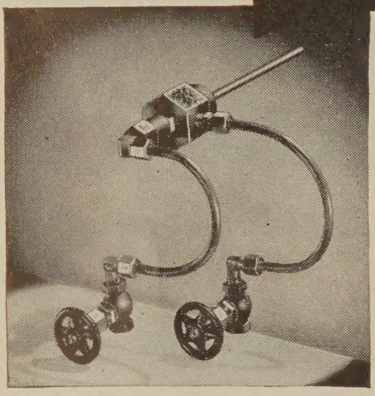


NOW

AVERT PLANT SHUTDOWNS!
HAVE 2 FUELS AVAILABLE!

OIL STANDBY EQUIPMENT

—inserted in 'Surface' High and Low Pressure Types Gas Burners feature quick change-over—
GAS-TO-OIL and OIL-TO-GAS.



EASY TO INSTALL — change-over gas-to-oil and oil-to-gas is a matter of seconds for most installations.

PREVENTS LOST TIME

● Proved in 159 furnace installations —1100 burners, during winter of 1947 by 61 enthusiastic users. Provides low cost insurance against lost production and shipping schedule upsets. Builds employee relations and creates customer goodwill.

ACT QUICKLY!—the demand for this new Oil Standby Equipment is rapidly absorbing the available production facilities for installation this fall.

SURFACE COMBUSTION CORPORATION
TOLEDO 1, OHIO

'Surface' INDUSTRIAL BURNERS AND FURNACES

ATTACH THIS COUPON TO YOUR LETTERHEAD AND MAIL

☐ RUSH 8-page bulletin giving specifications and engineering details.
☐ Glad to have your engineer determine our requirements.

NAME..

TITLE..

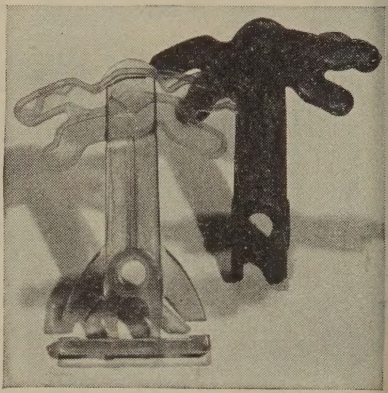
RETURN THE COUPON ↑ Today!

Dear Editor:

PLASTIC PATTERNS

Sir:

The article "A Critical Survey Investment Casting in the May issue states that no precision fou dry is equipped with plastic inje tion machines because no plast patterns are used. The photogra below may be of interest to sho the type of plastic pattern us



exclusively by the Midwest Foundr Co., Coldwater, Mich.

E. I. VALYI

A. R. D. Corp.
Coldwater, Mich.

● The new precision casting plant at Cold water was not in operation at the time dat was collected for the article, hence the state ment was correct at that time. However, th plant was in operation by the time th article was published so the statement wa incorrect at that time. Incidentally, the au thors point out that the article did not stat that plastics were not used as patterns rather that no plant had its own injectio machine. Our thanks to Dr. Valyi, who i well known for his work on precision cast ings, for the opportunity to correct the recor on plastic patterns.

PRECISION CASTING

Sir:

We are interested in obtaining a copy of your booklet "Precision Investment Casting—Lost Wax Process" . . .

H. LIPSEY

Mercast Corp.
Cleveland

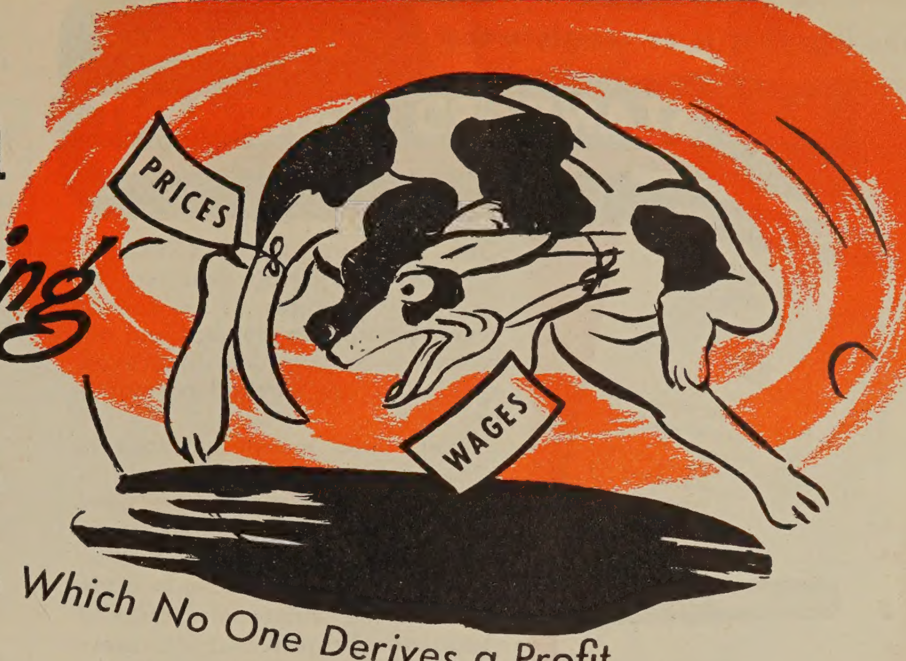
● Copies of the booklet are $1.00 each.—Ed

CUPOLA HOT METAL

Sir:

In your Newsfront section of the May 18 issue the following statement appeared: "The ability t produce cupola hot metal, fo charging into the openhearth, a costs less than the going price fo pig iron is arousing interest among cold metal steel shops. Resemblin

This is a *Fast Turning* Job



From Which No One Derives a Profit

t may be fun for a puppy to pursue its appendage—ut when the puppy is wages and the tail is prices, he situation is serious.

Once in a while the puppy catches the tail—but the strain is too great. So, prices break away—and the mad scramble is on again.

What causes the price-wages spiral?

The selfish interest of management, or labor? No, we think not. After all—both groups are composed of good citizens. And, as good citizens, each is entitled to receive fair pay for work done, plus a reasonable reserve to insure future security.

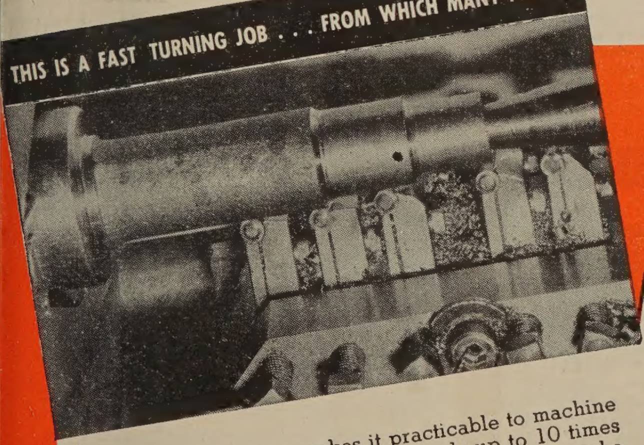
Is it, then, that the intrinsic cost of goods is becoming greater and greater? No. Modern tools of production enable one man and one machine to produce as much as 5 times more than they did 10 years ago.*

What, then? We might as well face the fact—the value of money is becoming less and less. A deteriorating currency is a basic cause of price rises—and wage increases are required to offset them.

The convertible gold standard is not perfect but it is the most practical and reliable measure of value ever devised. It provides the essential inflexible yardstick by which values may be compared, and commitments made with actual, as well as implied integrity.

A bill has been introduced in the Congress to restore stability to the dollar, making all currency freely convertible to gold. We suggest you write your Congressman for a copy of H. R. Bill 5031, study it, and take action.

THIS IS A FAST TURNING JOB . . . FROM WHICH MANY PROFIT



* Kennametal tooling makes it practicable to machine steel and cast iron at cutting speeds up to 10 times faster than those possible with steel tools; take interrupted cuts on steel and cast iron at the same speeds used for continuous cutting; cut steel in the hardened state, thereby often eliminating annealing and rehardening operations, and . . . turn out from two to five times as much as high speed steel tools on the same machine and in the same time.

This Bill is Needed to Guarantee a Reliable Index of Individual and Corporate Profit

H. R. 5031

To restore the right of American citizens to freely own gold and gold coins; to return control over the public purse to the people; to restrain further deterioration of our currency; to enable holders of paper money to redeem it in gold coin on demand; to establish and maintain a domestic gold coin standard; and for other purposes.

KENNAMETAL *Inc.*
LATROBE, PA., U. S. A.
MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTION

The line that is so complete that *Specialties*

ARE STANDARD EQUIPMENT

Binks Dusting Guns

For dusting and drying, blowing out chips, borings, filings, dust, shavings, etc., from machines; removing dirt from typewriters and adding machines — a type for every purpose.

Binks Model 171 Flock Gun

The most economical gun available for application of the new flock finish for decorative and sound-proofing applications.

Binks Model 12 Flow Gun

Flows sealing compounds such as adhesives, rubber cement, asphalt and similar heavy materials. Round or flat flow nozzles of many sizes and shapes can be swiveled as desired.

Binks Model 21 Spray Gun

A sturdy heavy-duty automatic spray gun for spraying all types of standard finishing products — can be used with spindle conveyors or turntables. Made with tungsten carbide inserts for ceramics.

One manufacturer — BINKS — supplies everything you require for spray painting . . . a line of paint spraying equipment and accessories so complete that even specialties are stocked as standard items.

Every item made by Binks is part of an integrated system. Standard connections are used throughout. Nozzle set-ups are interchangeable. But more than this, Binks equipment is precision made to meet the strict standards of America's largest manufacturers of automobiles, furniture, stoves, refrigerators and other products where the finish must be perfect.

Users of the BINKS line enjoy the big advantage of centralized buying of the best spray painting equipment from a single source.

"We will never take a back seat in the development of finer finishing equipment."

J. Roche
President

Binks Turntables

Manual and power-operated models for spraying all surfaces of large or small units. Six different models, plain and tilting tables to support loads weighing up to 400 pounds.

Binks Model 15 Spray Gun

A small, light gun for touch-up, highlighting, shading, stenciling, etc., where accurate control and fine adjustment are required on furniture, autos, toys, novelties, showcards, etc., etc.

Binks *Send now* for copy of new Catalog. See for yourself the completeness of the Binks line.

MANUFACTURING COMPANY
3116-34 Carroll Avenue, Chicago 12, Illinois

NEW YORK DETROIT LOS ANGELES ATLANTA BOSTON CLEVELAND DALLAS MILWAUKEE NASHVILLE
PHILADELPHIA PITTSBURGH ST. LOUIS SAN FRANCISCO SEATTLE WINDSOR, ONTARIO CANADA

BINKS

miniature blast furnaces, the cu
las are capable of up to 98 hr c
tinuous operation." Can you
us further information on this?

W. M. DILLC
Asst. to the Presi

Northwestern Steel & Wire Co.
Sterling, Ill.

• The item refers specifically to an inst tion at the Stanley Works, Bridgeport, C W. H. Hohn, openhearth superintenden Stanley will give you further informatic Ed.

ELECTRIC FURNACES

Sir:

Do you have a list of the ste
makers using electric arc melti
furnaces of large size. That
furnaces with shells of 15 ft ID
larger, or with at least a 25 t
holding capacity.

ALBERT E. GREEN
Metallurgical Engin

Greene Electric Furnace Co.
Seattle

• The "Directory of Iron & Steel Works the U. S. and Canada" published by American Iron & Steel Institute, New Yo gives exact information on the capacity the individual furnaces at the various plan We are sending a list of electric furnace st producers.—Ed.

ALUMINUM SKIMMER

Sir:

Newsfront in the May 4 issu
mentions an improved skimmer fo
molten aluminum. Can you advis
me where I can obtain furthe
information?

S. J. DICKINSON
Technical Advis

American Smelting & Refining Co.
Barber, N. J.

• Duraloy Co., Scottdale, Pa. will give yo further details.—Ed.

EXTRUSION MOLDING

Sir:

We would appreciate obtainin
two sets of tear sheets, pp. 62-69 o
"The Extrusion Molding Process" b
H. B. Cook from the Research Rec
ords of Charles C. Misfeldt whic
appeared in the Jan. 29 issue.

C. M. SMITH
Plant Manag

Budds Aero Castings Inc.
Canaan, Conn.

WASTER-WASTE WASTE

Sir:

What are the definitions of th
terms "Waste," "Waster," "Was
Waster," and "Waste Plate" a
applied to the tin mill products ar
sheet steel products.

JAMES I. ASNIN
Assistant Sales Manag

Chas. Williams & Associates, Ltd.
New York

• Waste-No such term; Waster-In blackpla and in sheet but not in coated tin mill pro ucts, sheet that is assorted as to gage b not as to size. In sheet it must be at lea

WEAN EQUIPMENT FOR THE CONTINUOUS OATING OF STRIP STEEL

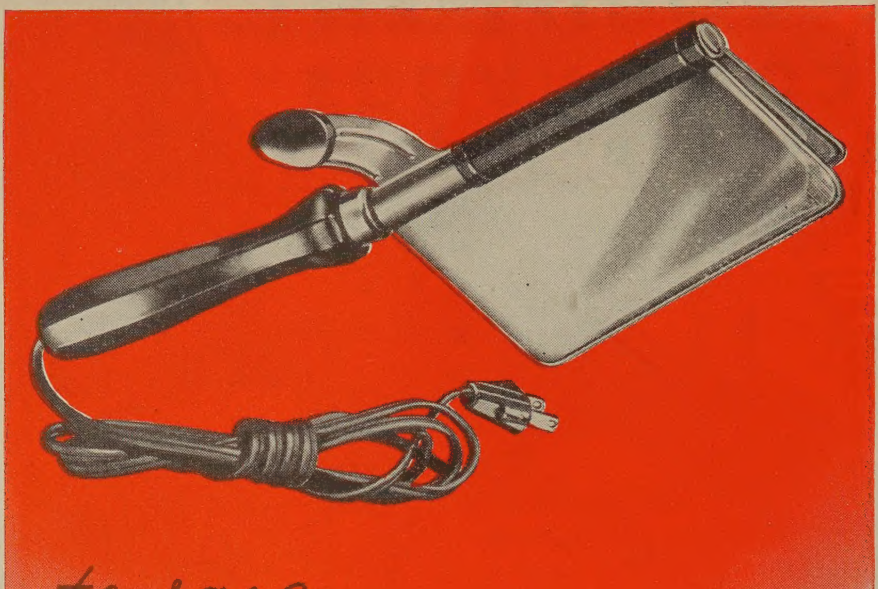
WEAN
WEAN
WEAN
WEAN

THE Wean Engineering Company is meeting today's demand for equipment to produce tin plate and zinc coated strip steel with light coatings by the electrolytic method; also equipment to produce chemically treated lack plate and strip steel. Equipment f coating strip steel with zinc and ter materials by the hot dip method so available.

the WEAN
ENGINEERING
COMPANY, Inc.
Warren, Ohio

Associate Company
WEAN EQUIPMENT CO.
CLEVELAND, OHIO

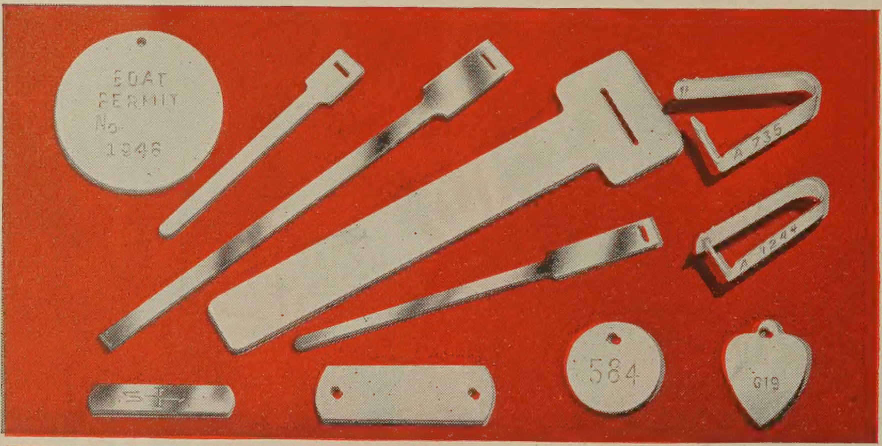
SPECIALISTS IN SHEET, TIN AND STRIP MILL EQUIPMENT



to save
HANDLING EXPENSES, *manufacturers*
use Pre-coated THOMASTRIP

Drawing, bending and forming operations may be performed easily with pre-coated ThomaStrip without danger of removing the coating. Any temper, as desired in cold rolled strip steel, can be obtained. We will be glad to share our experience with you, to arrive at specifications which will best serve your needs.

Use Pre-coated Thomastrip for small items



Thomas Strip
COLD ROLLED STRIP STEEL
REG. U. S. PAT. OFF.

ELECTRO-COATED ZINC,
COPPER, NICKEL, AND BRASS
... HOT DIPPED TIN AND SOLDER
LACQUER COATED IN COLORS . . .
UNCOATED PRECISION STRIP . . .
CARBON AND ALLOY SPECIALTIES

THE THOMAS STEEL CO. • WARREN, OHIO
COLD ROLLED STRIP STEEL SPECIALISTS

**18 in. x 48 in.; Waste Plate-The same t
as above apply in plate but the v
"Waste Plate" does not exist—it woulc
called "Plate Wasters," "Plate Waste W
ers," etc.; Reject—In sheet only, shee
known gage and size just a bit off p
quality; WasteWaste-A tin mill product
good enough for a second but mini
size 10 in. x 10 in. These definitions
be found more specifically in OPA
Schedule No. 6 which though not in l
effect, is still commonly used in the indu
for specifications.—Ed.**

AQUADAG

Sir:

In your May 27 issue, the arti
"Forging Die Life" mentions a
bricant named Aquadag. We wo
like to know the manufacturer
this lubricant.

WILLIAM H. PAU
Superintend

American Chain Div., American
Chain & Cable Co., Inc.
Braddock, Pa.

- **Aquadag is a suspension of colloi
graphite in water which is marketed
Acheson Colloids Corp., Port Huron, Mich
Ed.**

PRECISION CASTING

Sir:

Would it be possible for you
supply us with reprints of The Ir
Age articles on precision casti
that are listed in the selected bi
liography at the end of "Survey
Investment Casting" in the May
issue.

D. DUNHAM

Eastman Kodak Co.
Rochester

- **Tearsheets of the articles have been se
—Ed.**

CENTRIFUGAL CASTING

Sir:

I would appreciate very much re
ceiving a reprint or tearsheets o
the article "Centrifugal Casting i
Germany" which appeared in th
July 25, 1946 issue.

W. S. BEECHER
Chief Metallurgi

Indian Motorcycle Co.
Springfield, Mass.

- **Tearsheets have been mailed.—Ed.**

ALUMINUM SHEET QUALITY

Sir:

We will appreciate transmitta
of two copies of the followin
article: "Quality Control of Alum
inum Sheet" from the May 13 issu

L. ABRAMS

Conmar Products Corp.
Newark, N. J.

HEAT TREATING

Sir:

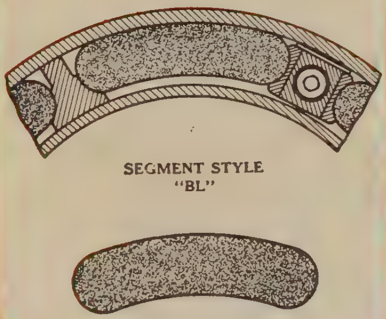
Please send me tearsheets o
"Modern Heat Treating, A Refer
ence Index" which appears in th
June 10 issue. Also, "Hydrogen Em
brittlement in Pickling" and "E

the grinding job

Surface grinding circular mold plate SAE 1050 steel on a No. 18 Blanchard Surface Grinder. This is a second machining operation, removing 1/8″ stock. Eliminates subsequent boring mill operation. Requires good commercial finish with no burn.

the wheel

N Borolon vitrified bonded abrasive segments, NA241-H7-V2 mounted in 18″ Blanchard chuck . . . standard for this operation because of good wheel life combined with heavy stock removal. This application is typical of the successful use of Simonds Abrasive Segments, available in all sizes and shapes to fit all standard chucks.



SEGMENT STYLE
"BL"

Borolon ALUMINUM OXIDE **Electrolon** SILICON CARBIDE

SIMONDS ABRASIVE CO.
PHILADELPHIA, PA.

Grinding Wheels

Every size and shape for every grinding job . . . centerless, crankshaft, cut-off, cylindrical, internal, knife grinding, mounted points, portables, roll grinding, saw gumming, snagging, surfacing (wheels and segments), tool and cutter, bricks, sticks, stones and abrasive grain for polishing, pressure blasting, anti-slip, etc.

where to get it

Simonds Abrasive Distributors in all principal industrial centers of the U.S. and in many foreign countries carry stocks and can advise on grinding wheel selection. Write today for Technical Manual on Modern Surface Grinding Practice. Also for name of nearest distributor.

SIMONDS ABRASIVE CO.
Philadelphia Pa
Electric Furnace Plant, Simonds Canada Abrasive Co., Ltd., Arvida, P.Q.

SIMONDS ABRASIVE COMPANY
is a division of
SIMONDS SAW AND STEEL CO.
Fitchburg, Mass
Saws, Machine Knives, Files

Other Divisions

SIMONDS STEEL MILLS
Lockport, N. Y.
Special Steels

SIMONDS CANADA SAW CO. LTD.
Montreal, Can.
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Quality control has characterized Simonds Abrasive Company products during more than 50 years as a major manufacturer of grinding wheels and abrasive products exclusively. This control begins with the abrasive grain produced in modern electric furnaces by Simonds Canada Abrasive Co., Ltd., and extends to the finished wheels for all types of grinding from roughing to precision finishing. This means consistently high wheel performance—long lasting action, that boosts production, cuts grinding costs.

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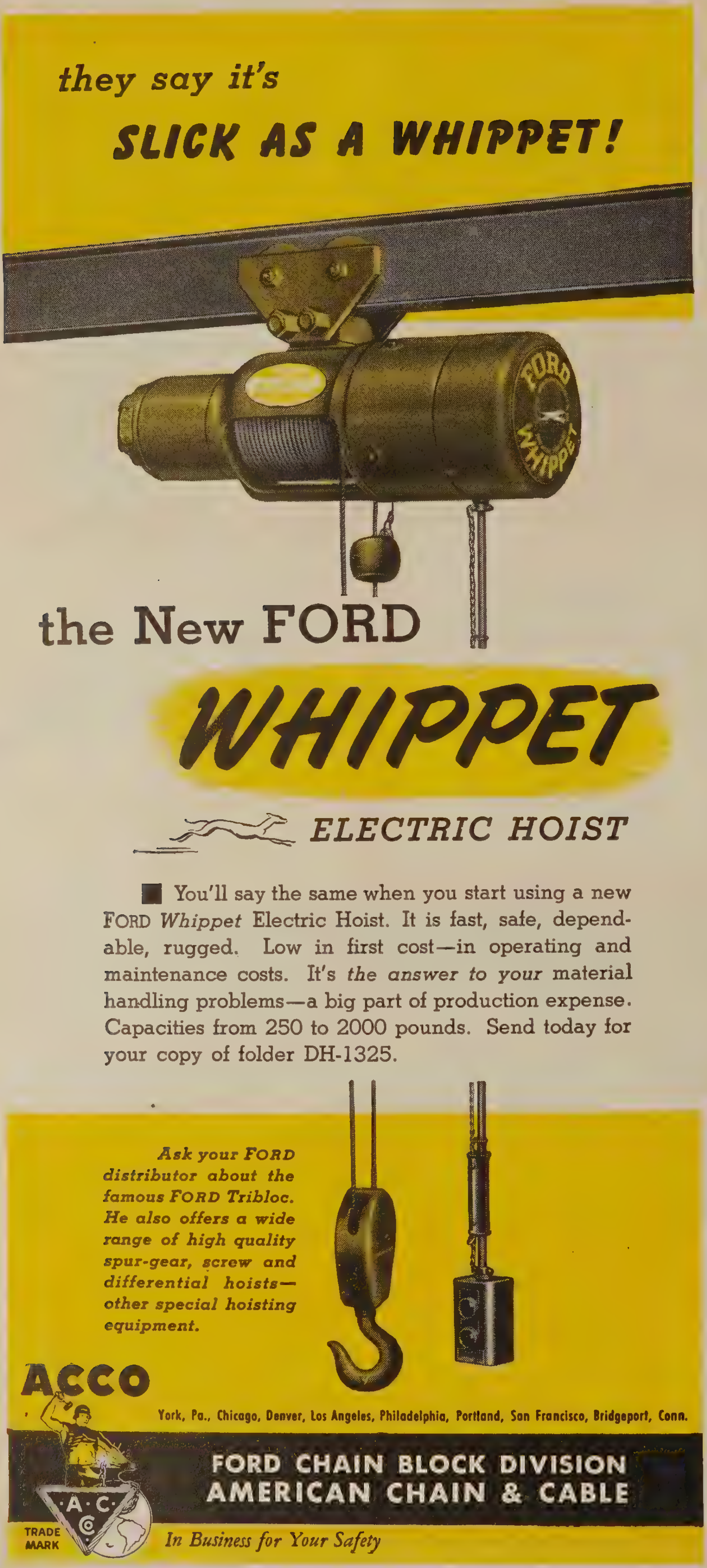

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fects of Hydrogen in the Corrosion of Steel" from the June 17 issue.

K. B. PRESSER
Chief Metallurgist
National Supply Co., Superior Engine Div.
Springfield, Ohio

SCALPING EQUIPMENT

Sir:

Can you give me information on scalping equipment? Such equipment is used in some nonferrous mills to remove surface defects from billets.

LEON C. HOLT
Reading, Pa.

• Most nonferrous mills use pneumatic chisels for scalping or removing spot imperfections. To remove skin imperfections covering a greater surface area from nonferrous slabs, the mills generally use standard slab millers. A list of manufacturers of such equipment has been sent you.—Ed.

METAL FINISHING MANUAL

Sir:

Enclosed is a purchase order for one "Metal Finishing Manual" at $3.00.

H. BANNER
Edwin B. Stimpson Co., Inc.
Brooklyn

HARDENABILITY SPECIFICATIONS

Sir:

Will you kindly send tearsheets of the following article: "The Practical Application of Hardenability Specifications" from the June 3 issue.

W. E. POULSEN
Process Engineering Dept.
Linde Air Products Co.
Tonawanda, N. Y.

SPRING DESIGN

Sir:

We would like to secure three copies of an article in the July 1 issue headed "Common Sense of Spring Design."

J. R. WAGNER
Purchasing Agent
L. A. Young Spring & Wire Corp.
Trenton, N. J.

PAINT REMOVERS

Sir:

A reference was noted to the article "Modern Paint Removers" appearing in your Oct. 9, 1947 issue. Would it be possible to obtain two copies?

FRANK B. FRANCIS..
Metallurgist
Anderson Carlson Mfg. Co.
Torrance, Calif.

• Two tearsheet copies have been mailed. —Ed.

DECARBURIZING PROTECTION

Sir:

Last year your magazine carried an item about a new paint that had been developed to prevent decarburization of steel that is being heat

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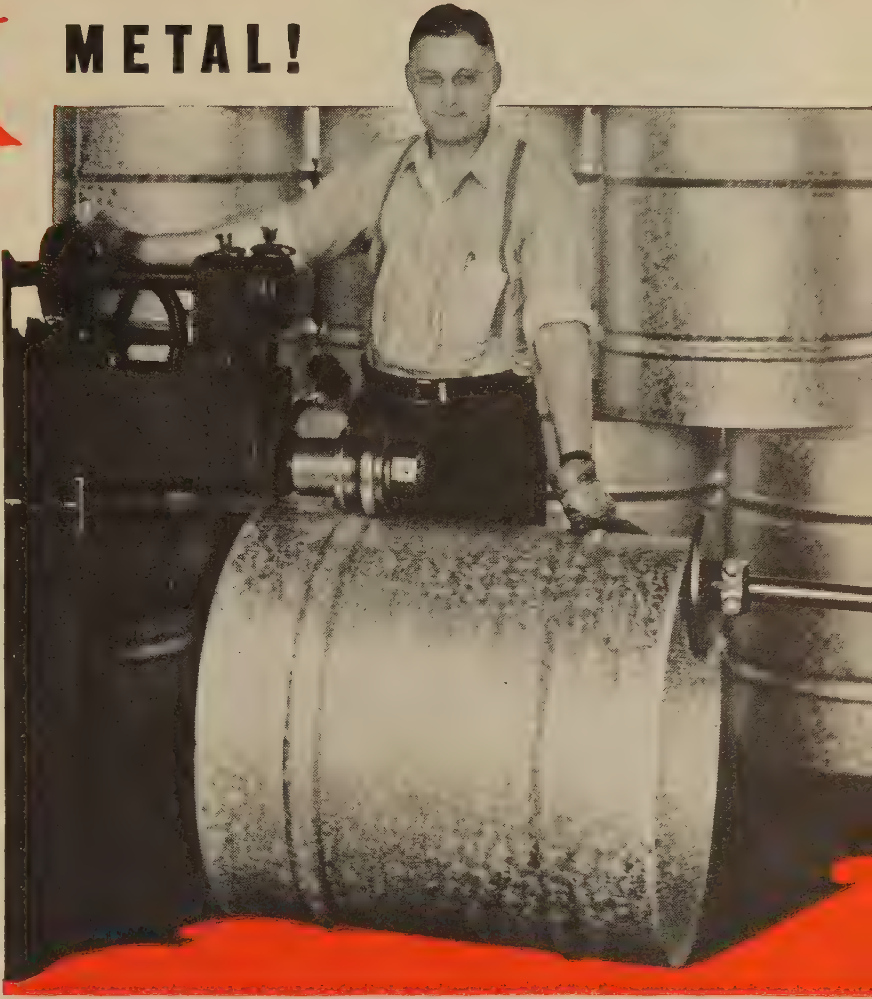

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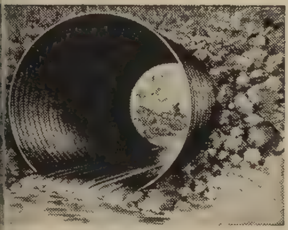

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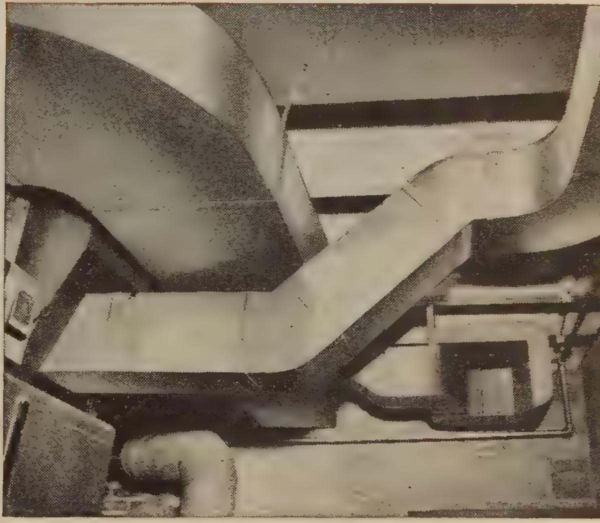

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J. P. TANNER

Tanner Machine Co.
Gastonia, N. C.

● Mr. H. H. Sweeny, National Copper Pain Co., Chicago, will give you further information on the paint.—Ed.

HAWAIIAN SCRAP

Sir:

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● The scrap metal trade is almost entirel handled through dealers and brokers wh assemble large tonnages from many source for resale to the principal users. We ar sending a list of the larger concerns on the West Coast. For a complete list of dealers write to the Institute of Scrap Iron & Steel Inc., Washington.—Ed.

HIGH TEMPERATURE MATERIALS

Sir:

If possible we would like to obtai copies of the articles "New High Temperature Material" in the Nov 27, 1947 issue and "High Temperature Materials by Powder Metallurgy" from the April 29, 1948 issue.

PAUL SUNDBACK

Lightening Fastener Co., Ltd.
St. Catherines, Ontario

SOFT METALS TESTING

Sir:

We would appreciate receiving a reprint of the article "Hardness Testing of Soft Metals" from the June 24 issue.

JOHN B. GIVEN
Metallurgical Laborator
International Business Machines Corp.
Endicott, N. Y.

PICKLING BATH EFFICIENCY

Sir:

In the April 29 issue there is a article "Detergent Additions Improve Pickling Bath Efficiency." I available we would appreciate receiving two copies of the article.

N. A. STONER

E. F. Houghton & Co.
Philadelphia

HARDENABILITY SPECIFICATIONS

Sir:

Please forward to this Arsenal tearsheets of the article "Application of Hardenability Specifications" from the June 3 issue.

A. H. MAGGS
Enginee

Watervliet Arsenal
Watervliet, N. Y.

IMPREGNATING CASTINGS

Sir:

If available, we would like to receive a copy of an article "Magnesium Castings Impregnated by New

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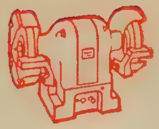

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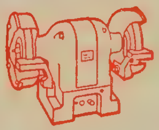

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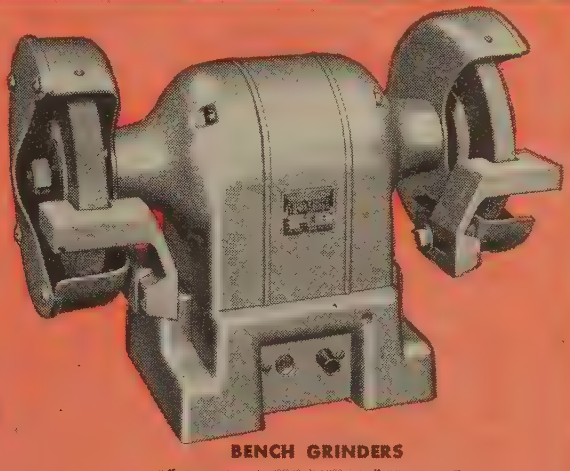

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Method" from the Nov. 11, 1943 issue. This was referred to in "A Study of Resinous Sealings for Porous Metal Castings."

CLYDE M. GRIFFIN
Director of Research
Lodge & Shipley Co.
Cincinnati

- **Tearsheets have been mailed.—Ed.**

INVESTMENT CASTING SURVEY

Sir:

We would appreciate receiving tearsheets of the article "A Critical Survey of Investment Casting" from the May 13 issue.

K. J. YONKER
Precision Casting Section
Allis-Chalmers Mfg. Co.
Milwaukee

BERYLLIUM COPPER

Sir:

If available we would like a copy of "Heat Treating Beryllium Copper for Peak Production" from the Dec. 6, 1945 issue.

G. D. MEYER
White-Rodgers Electric Co.
St. Louis

- **Tearsheets have been mailed.—Ed.**

CARBON CONTENTS

Sir:

We are interested in obtaining the article on "Maximum Carbon in Carburized Cases" as discussed in the Oct. 11, 1945 issue. Will you please send us the article or the book.

A. J. MANOLA
Alfred Heller Heat Treating Co.
New York

- **Tearsheets have been sent.—Ed.**

WELDING ROD COATINGS

Sir:

Will you please send us a reproduction of the article "Identifying the Constitutents of Welding Rod Coatings" appearing in your April 19, 1945 issue.

R. VAVRIK
Shober Sales, Inc.
Stockton, Calif.

- **A tearsheet copy has been sent.—Ed.**

FOUNDRY ARTICLES

We are interested in the following articles: "A Gray Iron Foundry Modernized" and "Oxygen in the Cupola" from the April 22, 1948 issue and also "How to Estimate Hardening Depth in Bars" from the Oct. 14, 1943 issue.

A. B. CASTRO
Metallurgist
Sargent & Co.
New Haven, Conn.

- **Tearsheets of the three articles have been mailed.—Ed.**

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Indexed in the Industrial Arts Index. Published every Thursday. Subscription Price United States, its Territories and Canada $8; other Western Hemisphere Countries $15; Foreign Countries $20 per year. Single copy, 35c. Annual Review Number, $2.00.

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Time For Quarantine

OUR military governor for Germany, Gen. Lucius D. Clay, has just returned to his post in Berlin after a hurried three-day conference in Washington with the President and his top aides. The press carries stories of flight missions to England, the Mediterranean, and Germany. New C-54s have been added to the Berlin air shuttle to raise daily deliveries to 4500 tons. The machinery for a draft of American manpower has been set up. Materiel of war is beginning to move to our Atlantic ports.

In the midst of all these unmistakable portents, a Federal Grand Jury has returned indictments against an even dozen Communist Party leaders, charging them with intent to overthrow this government "by force and violence." The indicted men have posted bail and are free - free to carry on their treasonable activities, to consult counsel, to address rallies of sympathizers, to state their case with whatever choice of fact and fabrication their interests may suggest.

The citizen who reads his daily paper and notes the course of Communist-incited crises in other parts of the world must regard with growing bewilderment and alarm the license which the domestic Red enjoys.

In the first place, the arrested "comrats" should be grateful that their conduct is being questioned "in fascist, imperialistic America" and not in "freedom-loving Russia." The elaborate regard for procedure growing out of centuries of Anglo-Saxon resistance to attempted tyranny is unknown in those "democracies" that flourish behind the iron curtain. Had they invited similar doubts regarding their behavior in Russia, the lads whose mugs appear in all the papers with FBI tags would be laboring in anonymous obscurity in the salt mines of Siberia.

In the second place, the visit of General Clay emphasizes anew that we are no longer at peace but in a state of war with our former ally. The siege of Berlin, the vicious character of Soviet propaganda, the instructions of traitorous domestic "commies", all document an active hostility which cannot properly be described by any other term but war.

If her armored columns are not knifing through Europe today, it is simply because Russia has chosen from her arsenal those weapons with which she is best able to fight. Her most effective fire power comes not from conventional ordnance but rather from the written and spoken word of millions of stupid stooges led by the hard-bitten professionals of the C. P. She has access to every forum which the amenities - possibly the folly - of civilized victims place at her disposal. Our daily press, our radio, many of our pulpits and college seminars, the UN, our labor unions, even our judicial processes, are more or less innocent accessories in the war which the Kremlin thugs are waging against a free world.

It seems, therefore, high time that we recognize the mortal peril in which we stand. Though they do not wear the formal garb of the Red soldier, the members of the C. P. wear the livery of the Kremlin no less definitely. To let them remain at large because of a quixotic reverence for procedure is an invitation to tragedy.

Joseph Stagg Lawrence

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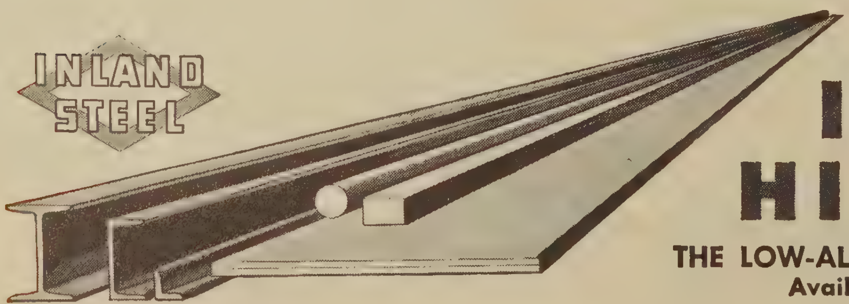

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AUGUST 3, 1948

NEWSFRONT

► Enactment of more stringent air pollution control laws in various states has renewed interest in possibility of utilizing a closed top design for cupolas as a step in controlling stack gas exhaust.

► Russia's steelmaking capacity got a shot-in-the-arm in recent months with the blowing in of blast furnaces at both the Stalin Steel Works in the Donetz Basin and at the Zaporoghya Iron & Steel Works. Coking batteries brought into operation at Chelyabinsk, Kharkov snd Yenakievo in addition to the new battery at the Smolyaninovka plant has brought Russian coke production up to a prewar level.

► Extensive tests conducted with an oxygen enriched blast in the side blown converter have proven successful in British practice. Shorter blowing time, greater flexibility, higher steel temperature, reduction in silicon and fuel consumption and a more consistent composition of the steel are several advantages reported. High oxygen cost seems to be the main deterrent to more widespread use of oxygen in the steelmaking practice as a whole.

► First carload lot shipments by barge since prewar days are now moving out of Pittsburgh. In anticipation of increased barge traffic in pipe and other steel products, American Barge Line is expanding facilities for handling carload business at nearby Glassport, Conway, Baden and Alliquippa.

► Several television set manufacturers are developing stainless steel receiving tubes to overcome one of their major production bottlenecks -- the all-glass hand-blown tubes. The idea is to spin a straight chrome stainless steel having the same thermal properties as glass to the tube shape and then seal a glass end to the metal to form a vacuum tube.

► Even with $2 billion worth of government contracts in its pocket and more to come, aircraft production will show little increase in 1948. Problem is not so much one of materials as manpower.

Needed steel and aluminum could be made available. But qualified engineering and technical personnel for key posts will be hard to round-up. Time will also be required for proper tooling.

► Use of a Pease-Anthony venturi scrubber has proven highly successful in removal of openhearth fume caused primarily by injection of oxygen in the bath. Results have been so satisfactory that tests are now underway in connection with blast furnace and electric furnace operations.

► Despite congressional authorization for the reimbursement of machine tool companies for the blocked orders for Russia and her satellite countries, the companies have not been paid. And according to reports, ECA is not very happy about taking over the machines.

► Confusion in the minds of steel buyers in Detroit probably exceeds that of any previous period in the history of the industry. In addition to endless calculations of new steel prices, decisions will have to be made as to the best steel sources. Most steel buyers predict anything resembling stability is several months away. Some sources look for a strong revival of previous efforts to build up Detroit as a steel center.

► Swedish iron ore exports this year are expected to reach 10 million tons, as compared with 8.5 million tons last year. The Government has proposed that the ore companies be permitted to mine 12.2 million tons per year for export in each of the next two years.

► Despite early estimates of machine tool requirements for a 70 group air force, set at 260,000, observers say that figure is greatly over estimated. Technically, the machining requirements for the proposed air force is a real problem. There are many parts that must be machined for which there is no known machining method. The Air Forces and a special committee of the National Machine Tool Builders' Assn. are trying to work some of these jobs out now.

► It is now becoming generally known why present British car models are frozen so much tighter than American cars. Steel for the new tools and dies must come out of the manufacturer's total steel allocation. Most British sources see no prospect for any immediate change in that condition.

► Steel producers in Indiana are having their legal departments investigate whether the state tax is applicable on shipments where the buyer sends in his own truck to pick up the product. It is believed that buyers may have to pay this charge which is not chargeable on rail shipments or on products delivered by the mill trucks.

Oxygen in the Electric

Although the role played by oxygen in steelmaking practice, particularly with respect to the openhearth, has been widely publicized during the past several years, relatively little editorial attention has been given to the electric furnace phase. Considerable experimentation has been conducted in both acid and basic furnaces utilizing oxygen and a large variety of steels have been made. In this article is presented a comprehensive resume of experiences involving the large basic units as well as the 2 to 6-ton foundry acid furnaces. Taking into account the different operating problems associated with acid and basic practice, the requirements and objectives for each type are considered separately, and in detail.

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THE substitution of gaseous oxygen for iron ore as an oxidizing agent in refining electric furnace steel was suggested by Bigge,[1] Browne,[2] and Chelius[3], and application of oxygen in producing low carbon steel has been recently discussed.[4, 5] High purity oxygen has been used for several years in shops making such steels. Because of the very definite advantages in using oxygen instead of ore in reducing carbon below 0.15 pct, most of the investigations were confined to these carbon ranges for both carbon and alloy steels. It was thought that the inherent benefits of oxygen over ore would not be of sufficient magnitude to justify the use of oxygen in refining medium carbon grades.

Present indications are, however, that oxygen has a definite place as a production tool in electric furnace practices, regardless of the grade of steel being made or the type of furnace employed.

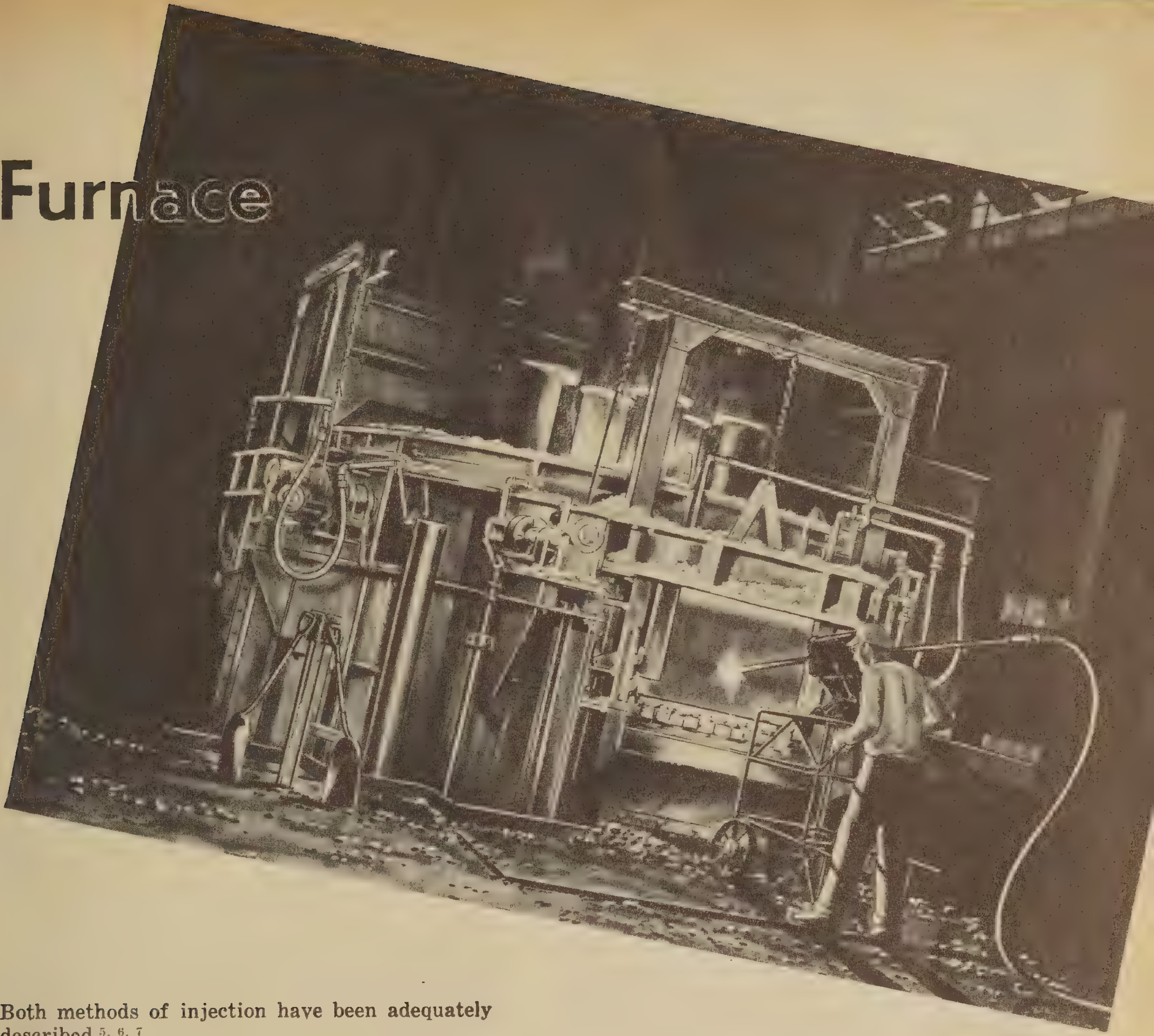
In order to present a comprehensive picture of the present practices with oxygen, the uses in acid and basic furnaces will be discussed separately for two reasons. In the first place, the basic practice is used for making various ingot grades, while acid furnaces are utilized by steel foundries. Secondly, while the chemistry of carbon removal using oxygen is essentially the same in the acid and basic practice, there are different operating problems which should be considered separately.

Basic Electric Furnace

Oxygen is widely used at present in the daily production of ingots in basic electric furnaces. It has three purposes in the furnace cycle: (1) removing carbon during the refining period, (2) controlling bath temperature, and (3) melting scrap. Fortunately, the same technique can be used to attain any of the above objectives, and in actual practice all three may be achieved almost simultaneously.

The method of using oxygen in the furnace bath is still evolving but two techniques have come into common use. The first is the iron pipe lance, in which the oxygen is injected into the metal bath slightly below the slag metal interface. Oxygen flow rates and pressures vary from 10,000 to 30,000 cu ft per hr depending upon the size of the furnace and the particular effect which is expected from the oxygen. The second method consists of a nonconsumable water-cooled device which directs a stream of high velocity oxygen through the slag and into the metal.

Furnace



Both methods of injection have been adequately described.[5, 6, 7]

The use of oxygen for carbon removal is now common practice in making stainless steel, alloy steels and low carbon steels. Fundamentally, the injection of oxygen provides a source of oxidizing reagent which is immediately available for use in the bath without decomposition of chemical compounds or preheating and fusing solid material. Consequently, all of the reactions of oxygen gas with carbon, and other elements such as manganese, iron and chromium are exothermic, and the rate of carbon removal is a direct function of the rate of oxygen supply, so that the time for adjusting carbon in the bath can be reduced to a minimum using oxygen. Moreover, the chemical efficiency of the oxygen is good. The major benefit of this characteristic of oxygen is realized in making heats with low carbon specification.

In low carbon heats, whether alloy or not, the time required to reduce carbon to final specification is long for two reasons. The rate at which oxygen can be supplied as ore is slow, and secondly the reaction between iron ore and carbon is an endothermic reaction (requiring heat). Moreover, as the carbon content of the bath decreases, the melting point increases and more power is required to maintain bath temperature and to give proper superheat for tapping than when medium carbon grades are made. By injecting oxygen directly into the bath, the carbon is rapidly removed and the bath temperature increases, even though the electrodes are raised and the power is off.

In addition, there is another advantage in using oxygen in producing alloy heats, in that oxygen enables the operator to reduce carbon rapidly in the presence of chromium without suffering the excessive losses of chromium to the slag. This feature in the production of alloy steels has been one of the primary factors behind the rapid acceptance of oxygen as a commercial method for removing carbon. The data in table I is typical of the experience of various shops using oxygen as a decarburizing agent.

Rapid temperature rise during the short time of injection is evident; in addition, the chrome loss is better than would be expected if ore were used. The rapid temperature increase when oxygen is used contributes to the conservation of chromium, since carbon seems to be removed preferentially in the presence of chromium if temperatures in excess of 3100°F are maintained during the decarburization period. To maintain such temperatures while using ore is difficult because of the inherent nature of the ore-carbon reaction. Moreover,, the extended period of time which would be required while using ore would cause considerable damage to the furnace refractories, even if these elevated temperatures could be maintained throughout the refining cycle. The shortened refining time using oxygen is undoubtedly a factor in preventing excessive chromium loss, since chromium is readily oxidized, and prolonged exposure of a bath of metal containing appreciable amounts of chromium would result in loss to the slag of this valuable constituent.

In addition, considerable amounts of low carbon silicon steel heats are being made using oxygen. Again, results are being obtained that are not possible with ore. One of the most important is reduction of diverted heats because of high carbon finishes; this has practically been eliminated with oxygen, since the melter is assured that the rate of carbon removal will be constant from heat to heat in the low carbon ranges. In table II are tabulated data from such heats.

TABLE I

Decarburization in Electric Furnace—Alloy Heats

Tons	C		Cr		O_2			Temp.
Tapped	Start	Finish	Start	Finish	Volume, Cu Ft	Time, Min	Cu Ft per Lb C	Increase °F
36.5	0.35	0.027	3.2	2.73	15,000	56	63.8	480
34.9	0.41	0.08	4.32	3.61	11,000	27	47.8	450
55.3	0.40	0.08	4.26	2.04	14,500	44	40.9	90
51.5	0.16	0.09	10.72	9.31	7,600	31	104.0	290

In all of these applications, appreciable heat time has been saved and substantial power savings have been realized. It is interesting to note that in the silicon steel heats the efficiency of oxygen, based on carbon removal, is dependent upon the carbon content at the start of the decarb period. The theoretical oxygen consumption per pound of carbon removed (assuming that carbon monoxide is the end product of the reaction) is 16 cu ft.

From the above discussion, it is evident that oxygen can also be used to advantage when a rapid increase in bath temperature is desired or to speed up melting. Where the heat is partially melted, the oxygen lance can be applied under the partial slag cover to rapidly melt remaining scrap on the bottom. In addition, when it is necessary to raise the bath temperature because a heat is sluggish or the lime is slow coming up, short injections of oxygen result in a fast increase in bath temperature and start a general bath action. This "bottom to top" method of putting heat into the bath is particularly effective, and, where the slag cover is present, there is a furnace within a furnace condition—which promotes heat efficiency. Thus, while the present high-purity gaseous oxygen is primarily considered as a method of removing carbon, there are other definite uses for it in both the melting and conditioning period of the electric furnace cycles.

Acid Electric Furnaces

In the process of developing the use of oxygen in electric furnaces, the economy of using the present available oxygen was quite apparent when low carbon grades of steel were made in ingot shops. However, little interest was evident at the start of the application of the process in the manufacture of steels which finished in the carbon ranges of 0.20 pct and higher, in that it was thought there would not be sufficient advantage in power savings, or shortened cycle time to offset the cost of oxygen. The rate of carbon reduction using ore is fairly rapid in the medium carbon ranges.

Also, the steel made in acid electric furnaces was used in foundries, and the question was present as to whether or not the foundries would be able to take advantage of any time savings that might be inherent in the use of oxygen instead of ore in making carbon grade steels. However, there has been considerable interest recently in using oxygen in small, acid electric furnaces for producing casting grade steels, and experiments have been made in furnaces ranging from 2 to 15 tons capacity.

Certain changes in the technique of introducing oxygen have proved desirable in working these smaller furnaces. In the first place, the characteristic of the acid slags is such that a protective coating of slag is readily formed on a pipe inserted in the bath, so that the usual need for high oxygen flows and pressures to conserve pipe life is not too important. Secondly, the use of high pressure and velocities in furnace of small diameter and with a comparatively low roof might cause refractory damage. Most work done in furnaces of 2- to 6-ton charge has been with oxygen flows of 6000 to 8000 cu ft per hr, and a flow pressure of 30 to 40 psi. Parenthetically, it might be noted that ¾-in. pipe seems most satisfactory for this use, and four to five heats of 6 tons can be decarburized with one length of pipe.

As in the basic furnace, the use of oxygen in the acid furnace gives a rapid, efficient method of carbon removal, control of bath temperature and increase in production rates. In making carbon steels, such as grade B, it has been found that the temperature of the bath at the start of the oxygen introduction is important. If the bath temperature is high at the start of the

TABLE II

Decarburization in Electric Furnace—Silicon Steel Heats

Tons	C		Mn		FeO		O_2		
Tapped	Start	Finish	Start	Finish	Start	Finish	Cu Ft	Time, Min	Cu Ft per Lb C
41	0.31	0.062	0.41	0.34	7.72	11.34	5,100	10	25
43	0.29	0.05	0.30	0.12	25.38	14.40	12,500	15	100
42	0.41	0.03	0.39	0.17	....	....	4,600	18	14

oxygen injection, it has been found that carbon will be oxidized but relatively small amounts of silicon and managanese will be lost. If the oxygen is started at a lower temperature (about 2850° to 2900°F), the silicon and managanese will be oxidized to the same levels as experienced with ore practice.

This is shown in table III, where in the first heat the oxygen was started when the bath temperature was about 3000° while in the other two heats the bath temperature was approximately 2900°F.

With the exception of one type of application of oxygen in carbon steels, the efficiency of oxygen based on carbon, manganese, and silicon removed is generally better than 100 pct.

At first thought, to use oxygen to reduce carbon in ranges where ore reacts quite readily would not appear to be particularly advantageous. However, problems vary from shop to shop, and in the main there seem to be differences in the rate of carbon removal with ore in furnaces of apparently the same design. By analyzing the furnace cycle in each shop, it is usually apparent that there is an opportunity by speeding up the melting, raising the temperature of the bath rapidly, or increasing the rate of carbon removal to shorten the cycle time, and conserve power, ore, and labor costs.

For example, there is a fairly definite temperature limit in an acid bath below which iron ore will not react with carbon. Moreover, as the temperature of an acid bath is raised, FeO is liberated from the slag for reaction with oxidizable elements.[8] Because ore additions chill the bath, if ore is added while the temperature of the bath is low, and the temperature is rapidly raised, the combination of FeO released from the slag and the excess oxide present in the ore will cause a very strong boil, that may be so violent that the bath will have to be chilled to stop the reaction.

In some furnaces the vigorous reaction can be tolerated and then a very rapid elimination of carbon with ore is accomplished; in other furnaces the violent reaction or blow must be stopped. In the latter case, if a heat melts-in higher in carbon than expected, the time of carbon removal with ore becomes an appreciable part of the furnace cycle, even though the carbon ranges are such to promote rapid removal. In both cases mentioned, oxygen can be used efficiently and economically.

It has been found that in furnaces which experience the violent reaction condition, oxygen can be used entirely in place of iron ore, and the carbon reduction will take place rapidly and without a violent bath reaction. The reason for this is that in using the oxygen the metal is higher in oxygen, or FeO, than it would be if slag and metal were in equilibrium for a given temperature. Since the rate of reaction for carbon is purely a function of oxygen supply, the rate at which oxygen is available, as oxygen gas, is uniform, and consequently there is no sudden evolution of available FeO from the slag.

Moreover, instead of a spasmodic reaction with carbon as FeO is freed from the slag because of temperature increase, the rate of carbon drop compared with time becomes quite uniform and consistent when oxygen is used. Heats can be adjusted for carbon in 5 or 6 min which might require a half hour or more because of the tendency to blow. Obviously, in shops or furnaces where this condition prevails, the use of oxygen on every heat is justified, since power savings alone will offset the higher initial cost of the oxygen.

In furnaces where it is found that carbon removal with ore is rapid, oxygen gas may be used profitably to bring the metal bath quickly to the temperature for the ore reaction. In working with such furnaces, from 50 to 100 cu ft of oxygen per ton of metal is injected immedi-

(Continued on page 144)

TABLE III

Decarburization in Acid Electric Furnace Heats

	Elements Affected								
	C		Mn		Si				
Tons Chgd.	Start	Finish	Start	Finish	Start	Finish	Cu Ft	Efficiency, Pct	Time, Min
6	0.52	0.24	0.55	0.45	0.52	0.43	630	122	2:00
6	0.41	0.30	0.26	0.19	0.48	0.10	570	151	1:45
15	0.59	0.23	0.28	0.08	0.16	0.03	1800	125	6:00

New Machine Speeds Turbine

By W. A. LLOYD
Cleveland Regional Editor,
The Iron Age

A MEASURING machine employing a combination of optics, light beams and photography, to measure and dimensionally record the contours and angular twists of mixed flow and axial flow compressor and gas and steam turbine blades, and capable, within the limits of the machine, of measuring and dimensionally recording most contours where close tolerance inspection is required, has been announced by Measuring Machines, Inc., Cleveland.

The machine, fig. 1, will mechanically measure to ±0.00025 in. across the width of a blade in increments of either 0.0125, 0.025 or 0.050 in. at a speed of approximately 0.375 in. per min, or can give a continuous trace outline of the blade contour at approximately 0.750 in. per min and providing a permanent photographic dimensional record.

The machine is comprised of five major components: a precision three-dimensional table, a probe and tracer arm unit, a light beam and optical system, a photographic recording system and a control panel. An assembly diagram of the unit is shown in fig. 2.

The precision three-dimensional table is of special design, manufactured for Measuring Machines, Inc., by Pratt & Whitney Co., Hartford, Conn. The accuracy of the vertical and transverse motions is maintained to within 0.001 in. accumulative error in their total travels, and the longitudinal motion is held to ±0.0001 in accumulative error in 6-in. travel.

The basic dimensions of the table are: Working surface, 18x2.75 in.; longitudinal travel, 9.25 in.; transverse travel, 3.625 in., and vertical movement, 8.875 in.

The probe and tracer arm unit consists of an aluminum frame in which are mounted two diamond pointed probes, operating in precision reciprocating bearings, two magnesium transfer arms operating on precision jewel staff bearings and two magnification rotors on which are mounted two recording mirrors.

The light beam and optical system consists of a special scale light projector for progressively printing the vertical dimensional scale on the photographic paper. A print light operates through an optical system consisting of a group of special condensers and lense for recording the dimensional contour of the part being inspected.

The photographic recording system consists of a controlled paper drive mechanism, a print light recording aperture and a special paper scale comb.

The control panel consists of a blade increment selector, manual and automatic control switches and all necessary safety lights for automatically warning the operator of paper run-out, light run-out, over-run on the table travel, etc.

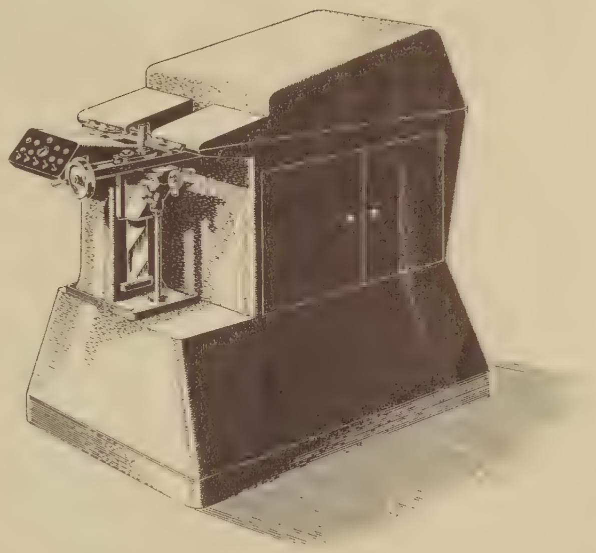
The procedure for setting up a blade for inspection consists of the following operations: After a suitable fixture is obtained for holding the base of the blade, the fixture is mounted on an angular precision rotating table, which in turn is mounted directly on the precision three-dimensional table. That section of the blade which is to be measured or inspected is located on the blade and that point is brought up to and contact made along the undercambered surface of the blade with a locating knife edge. After the blade has been adjusted in relation to the longitudinal travel of the three-dimensional table, it is moved up to a position gate which determines the starting point of the inspection cycle. The positioning gate consists of a simple knife edge whose contact with the leading edge of the blade is determined by a lighting system located on the control panel. After the blade position is determined, this gate is then removed and the automatic control switch on the control panel turned on at which time the inspection cycle begins. As the blade moves between the two probe points, maintaining contact with the blade surface, the probe motion is transferred in a plane perpendicular to the direction of table travel axis and is conveyed through two transfer bands to the transfer arms to another set of transfer bands which actuate the magni-

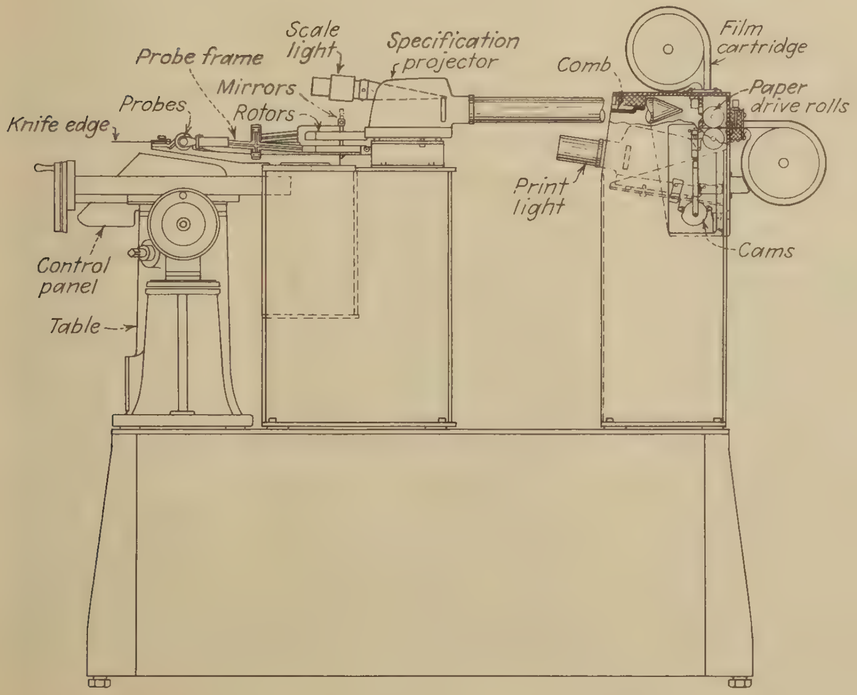
Blade Contour Measurement

A new machine that measures contours of compressor and turbine blades to an accuracy of ±0.00025 in. at a rate substantially higher than other present methods, and which also provides automatically a permanent photographic record of the blade dimensions, is described in this article.

fication rotors containing the recording mirrors.

This operation is repeated by the individual probes and, depending upon the increments selected, the blade moves between the probes a distance equal to the pre-selected increment. Upon reaching this point, all motion of the table is stopped. The print light actuated by a calibrated cam system then automatically flashes on and records the upper and lower points of the blade section on the photographic paper. The scale light is then automatically turned on in conjunction with the paper drive motor and the vertical dimensional scale is progressively printed until such time as the table has moved the distance equal to the pre-selected increment. This cycle is continuously repeated until the complete section of the blade has been checked and a perma-



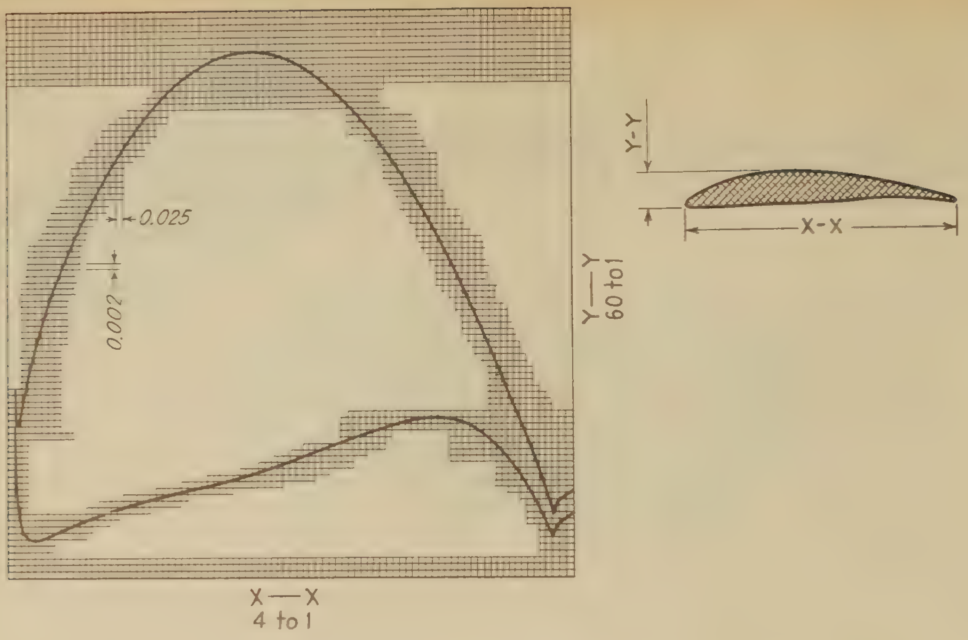

Scale light
Specification projector
Film cartridge
Probe frame
Mirrors
Comb
Paper drive rolls
Probes
Rotors
Knife edge
Print light
Cams
Control panel
Table

ABOVE

FIG. 1 - The new machine for measuring contours of compressor-and gas and steam turbine blades.

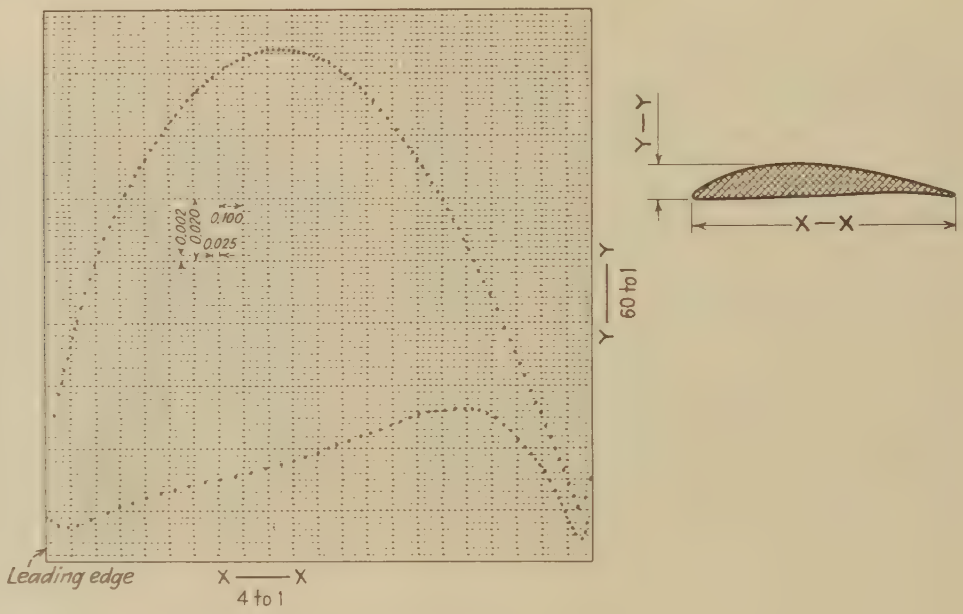
LEFT

FIG. 2 - Assembly diagram, side elevation, of the new measuring machine.



LEFT

FIG. 3 - Typical chart of a continuous trace of a blade section contour.



RIGHT

FIG. 4 - Typical chart of an intermittent trace of a blade section contour.

nent dimensional record made. After the inspection of the contour has been completed, a projector is automatically turned on that records directly on the photographic record the blade number, section number, inspector's name and any other information pertinent to the blade being inspected.

The next section of the blade to be checked is brought up to position and in contact with the knife edge at which time the angle of twist of this section relative to the first section checked can be readily obtained by a direct reading from the protractor on the angular rotating table.

The resulting permanent record which is developed in readily available developing and fixing solution, is a dimensional record magnifying four times the chord along which the blade section is being inspected, and either 20, 30, 60, 80 or 100 magnification through the coordinates perpendicular to the chord line of the section being inspected. This record can then be checked against the print dimensions or any theoretical layout of the blade being inspected and any errors can be readily detected. From this record a master chart can be made that does not require the customary drafting room layout where humor errors must be contended with, but rather the master is made directly from the previously discussed permanent record. At the same time any tolerance lines or circles can be located in the master record chart. Typical charts resulting from an inspection are shown in figs. 3 and 4.

The coordination of the five components of the machine is controlled by a special cam and relay system calibrated to very close tolerances, these motions being actuated by two 117-v, single phase, 60-cycle, ac motors.

Temperature and vibration have little effect on the machine's operation and it is not absolutely necessary to install the machine in a gage room, although this condition is desirable.

It has been found that this method of inspection has an efficiency over other conventional methods of as much as 1000 pct. The over-all dimensions of the machine are: height 61 in., width 42 in., and length 55 in.

Magnetic Particle Inspection in Engineering

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The important role played by magnetic inspection as a supplement to other testing procedures in the quality control of aircraft components and weld sections is discussed in this article. A description of the equipment used and of the methods followed in detecting various types of defects is presented and the need for establishment of inspection standards emphasized. A convenient method for recording results of magnetic inspection tests is also illustrated.

MAGNETIC particle inspection is the method of locating defects in ferrous materials by flowing a light mixture of iron oxide in oil over the part and then magnetizing the part. Flaws in the material break the continuity of the magnetic field and magnetic poles are formed which attract the fine particles of magnetic oxide.

In engineering design, several factors are used; factors for repeated loading, factors for shock loading and factors of safety. Where nondestructive magnetic inspection is used, the factor of safety can be reduced by the amount allowed for defective material. To design for material of the highest quality without magnetic inspection entails extremely rigorous control of both making the raw material and fabrication of the finished product. This results in a very expensive article. To design for reasonable defects with a sufficient factor of safety increases the weight of the article and sometimes wastes metal. To design for highest quality material and then supply an inspection system to catch the occasional defects in the material such as is done with magnetic inspection for ferrous materials, gives the advantage of the best design with an economical method of production.

When the engineer designs a component, he establishes for the part a factor of safety. If the value is large, the problem is not serious, whereas if it is small and an allowance has not been made for defective material, 100 pct magnetic inspection, or at least, 10 pct magnetic inspection is required. Obviously when any defective parts are found in a lot, the entire lot should be inspected. No plant desires to burden itself with 100 pct inspection. In peacetime, only critical parts should be so examined. The engineer is in the best position to know which are the critical parts and to what extent they should be watched.

Occasionally, management might decide that, due to the nature of its product, there will be no magnetic inspection; or, the process might not even be considered. At the other extreme in the aircraft engine and aircraft industry every structural part that might endanger the lives of people through failure is subject to 100 pct magnetic inspection.

This overall requirement of an entire industry brings up many problems of methods, control and standards of inspection. The economics of

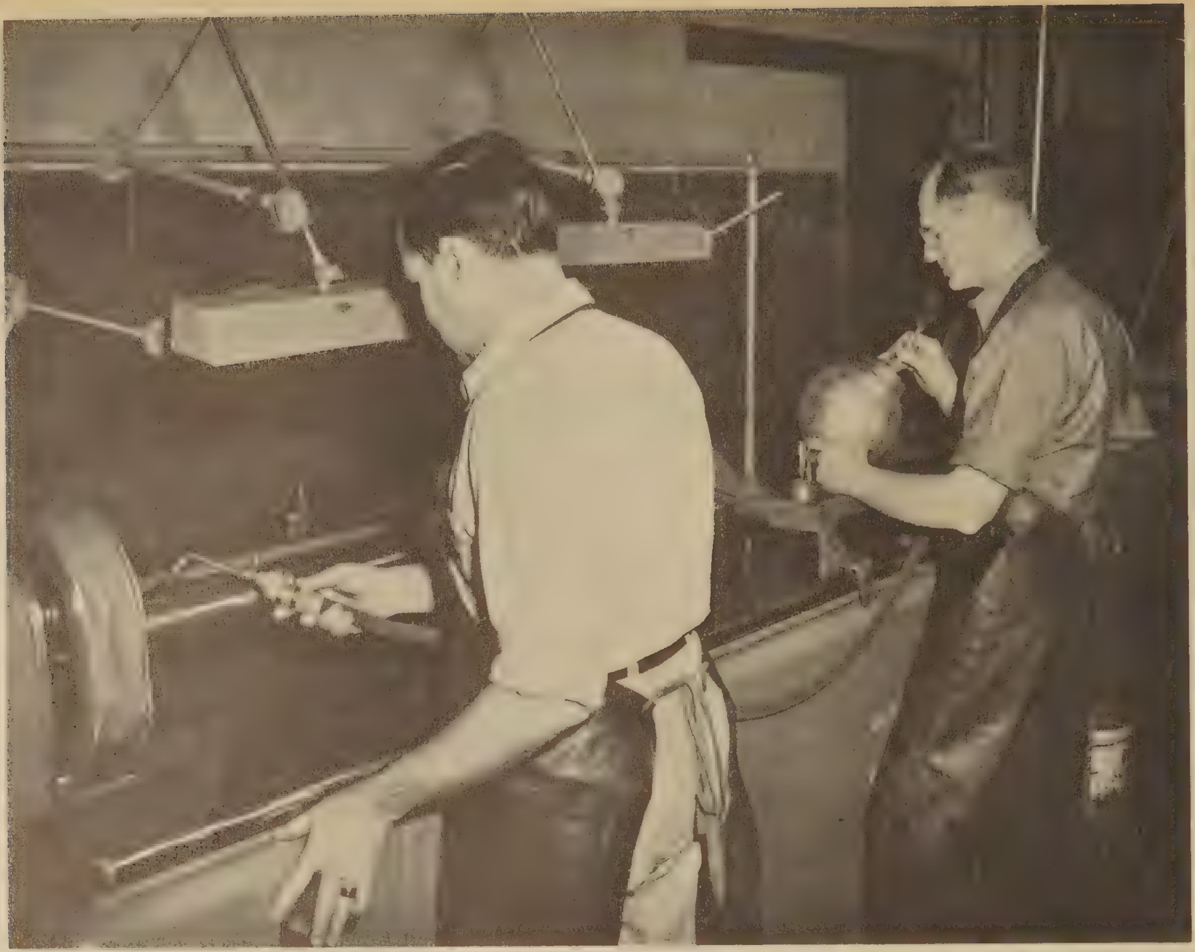

FIG. 1 - Magnetic inspection machine. The operator on the left is flowing the magnetic oxide over a large piston rod preparatory to sending an electrical charge through the part to create the magnetic field. The inspector on the right examines the internal surface of atomic hydrogen welds used in fabricating hydraulic accumulators.

the requirement is also a big factor. It does not pay to complete a lot of parts and then have many, or all, rejected at final magnetic inspection. Therefore, it may be necessary to inspect the raw material and the parts several times during fabrication. Also, a welded assembly or angular part might require magnetization in several different directions in order to locate as many defects as possible. This multiples the requirement of 100 pct inspection several times and makes it necessary for the use of sound judgment. Coupled with the quantity factor in inspection is the quality phase, or the location of defects that are detrimental to the part and the location of false indications that are not detrimental.

Inherently, magnetic inspection is a rapid operation. Perhaps the best way to describe the process is to examine the equipment and methods of magnetization. The use of polar or longitudinal magnetization for the detection of flaws in steel is magnetization of the part so that it has north and south poles, as has a horseshoe magnet. A part can be magnetized in this way by holding it in a coil and passing an electric current through the coil, or by placing the part on a magnetic chuck possessing north and south poles and allowing the magnetic field to flow through the part. Thus, the part is magnetized longitudinally. Flaws that exist transverse to or at an angle to the direction of magnetization will be revealed, while flaws that run parallel with the direction of magnetization, such as laps, seams and inclusions in bar stock, are not likely to be revealed. These defects are detected by circular magnetization, which is produced by passing a low voltage high current electrical charge through the part. The magnetic field flowing around the current magnetizes the part in the circular path that it is following.

A standard machine for magnetic inspection, such as the one shown in fig. 1, is provided with two heads between which a part can be placed and a current passed through the part for circular magnetization. It is also fitted with a coil that can encircle the part to induce polar magnetization. The machine is equipped with a pump to circulate the mixture of oil and iron oxide and a nozzle to flow the solution over the part. As soon as the part is covered with solution, it is magnetized and examined for flaws, or it may be moved to a second inspector for examination while another part is being magnetized.

Immediately after inspection, the part is demagnetized by passing it through a coil in which an alternating current is flowing; then it must be washed and oiled before going on for further machining or to finished stock.

A typical magnetic inspection station is shown in fig. 2. Forgings and heat treated parts can be cleaned by sand or shot blasting, while parts from the machine shop may be cleaned in tank No. 1, which contains a deodorized kerosene. Then the parts are magnetized, inspected and stamped, followed by demagnetization at station No. 4. The iron oxide would promote rusting, so in tank No. 5 most of the oxide is removed with deodorized kerosene and a final cleaning is done in tank No. 6 in the same solution. Since the parts are relatively clean and subject to rusting, they are dipped in tank No. 7 in a mildly rust preventative oil. The quantity of parts inspected can be increased and the work made easier for the operator by providing washing and oiling tanks with air-operated trays that move up and down through the oil by throwing an air valve. After washing in these tanks, the trays are moved to the top of the tank and allowed to drain. Floor space is also saved, for with hand dip tanks, a drain board as large as the tank must be provided to drain the oil off the parts.

The U-shaped arrangement of the work area, fig. 2, saves many steps because the inspector finishes the cycle in the proper place to start the next cycle. The large volume of work that usually undergoes magnetic inspection makes it advisable to give considerable thought to the arrangement of the equipment at the magnetic inspection station.

Parts too large to fit into the machine may be tested by fastening heavy flexible copper cables to the heads of the machine and either winding a coil around the part for polar magnetization or fastening the cable to two ends of the part for circular magnetization. Also, copper prods may be fastened to the ends of leads to produce a magnetic field in any part of a structure by the passage of current between the prods. Welds are often inspected by this method with a portable magnetic machine with flexible leads and prods. Placing the prods across the weld will reveal defects that cross the weld and placing the prods along the weld will reveal defects that are parallel to the weld.

The method of application of the magnetic powder may be varied. In addition to the wet method, dry powder may be dusted on or blown on with a special blower and either red or black powders are available.

Magnetic inspection personnel usually consists of men who were formerly machine operators, inspectors or material laboratory workers. After working as helpers for approximately 6 months, they are permitted to take the test for magnetic inspection operator. Following services as an operator for 6 months to 1 year, the employee then is allowed to take the test for magnetic inspection inspector. In the aircraft industry, the inspector is authorized to accept or reject work, while the operator is only authorized to magnetize the work.

The amount of current required to locate indications is easily learned from experience. In circular magnetization, it is desirable to keep the current density and the length of time below the amount that will cause noticeable heating of the specimen. In polar magnetization, the amount of current depends on the size of the coil and is fixed in the design of the machine. Flaws are revealed over a wide variation in current density, increasing in intensity with increased current.

The third and final member of the magnetic inspection team is the magnetic inspection supervisor, who is usually a member of the metallurgy or engineering department. He is qualified to set up standards of acceptance or rejection of parts with magnetic indications after correlating the importance of the indications with the results of laboratory tests, mechanical tests and the stress conditions of the part as determined by the engineering department.

The interpretation of indications found in magnetic inspection and the evaluation of their seriousness for acceptance or rejection of the part is the most difficult part of magnetic inspection and the cause of most disagreements. Take the case of the nut and bolt. The standard practice of inspection of primary or heat-treated bolts is circular magnetization for longitudinal defects such as large seams, followed by demagnetization and then polar magnetization to detect transverse defects such as hardening cracks. Nuts are inspected by circular magnetization which reveals the most serious type of defects found in nuts. The function of these fasteners is sufficiently important to warrant these tests, since it is obvious that failure of an engine or falling off of a wing due to the normal load applied to a bolt or due to fatigue failure of the bolt, cannot be tolerated.

A disagreement arose several years ago at a

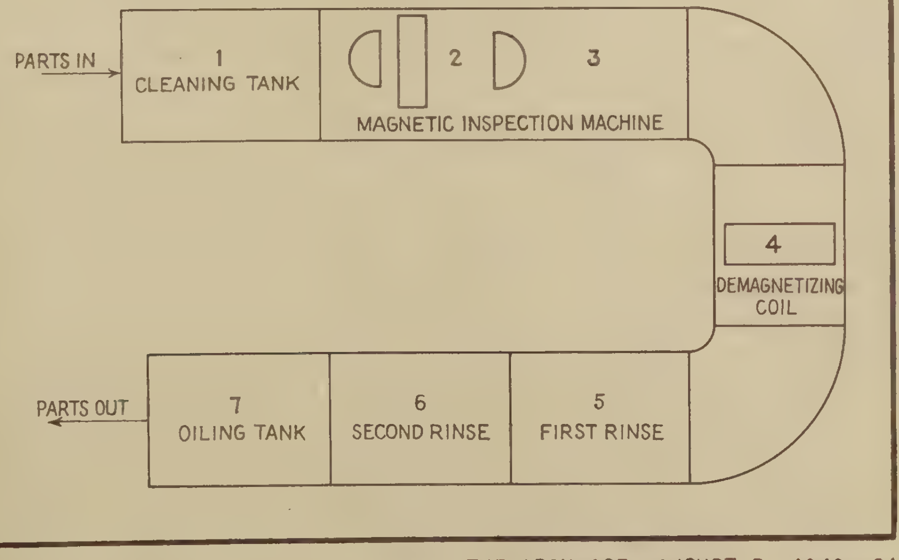

FIG. 2 - Plan view of a typical magnetic inspection station. In this arrangement, the operator completes one cycle in the proper place to start the next cycle.

meeting on aircraft fasteners whereby the technical division of the American Institute of Bolt, Nut and Rivet Manufacturers disclosed[1] the fact that a lot of bolts had been sent to nine laboratories for magnetic inspection and that nine different sets of acceptance tests resulted. On the basis of this variation, magnetic inspection was rejected. A subsequent challenge made by W. E. Thomas[2] of the Magnaflux Corp. to the fastener industry to set up standards of acceptance and rejection of bolts in magnetic inspection was unheeded.

Industry is not so much concerned with failures that occur in tightening up bolts, it is the fatigue life of the bolt that is most important. Fatigue failures start at the points of stress concentration and usually at the surface of the material where stresses are the highest. Indications revealed by magnetic inspection are often points of stress concentration.

In a discussion of Thomas' paper,[2] the bolt and nut industry quotes Wright Field officials as stating that the standards for nuts and bolts are the physical tests plus good workmanship, and the industry insists that magnetic particle inspection not be used as a basis for final rejection.

This attitude is difficult to understand when one considers the meticulous manufacturing procedures followed in the production of these fasteners.

This is a typical example of what can happen. The same type of problems have arisen in connection with the magnetic inspection of resistance butt flash welds and on other controversial issues such as indication on a large 4130 steel tubular piston rod shown in fig. 3. Since the rod is about 4 in. in diam, it is readily seen that this is a fairly long indication. Sufficient metal had been removed from the surface of this tubing to be into sound metal. The tube had been heat treated, ground and polished and hard chromium plated. A cross-section was taken through the indication and prepared for metallographic examination. In the photomicrograph in fig. 3, of the unetched cross-section, the inclusion in the steel that caused the indication is readily visible. Also, the chromium plate may be recognized and it is important to note that the plate has been uniformly deposited right over the inclusion.

Late in the war, many companies had established standards of magnetic indications. These standards were usually established for certain critical parts and were not generalizations pertaining to any part. The standards were set up in different ways, all of which involved a considerable amount of serious testing. For example, a heat of bar stock might show numerous magnetic indications. Twenty-five or 50 cross-sections might be taken from different bars in the heat of steel and all of them polished for metallographic examination. If all of the indications proved to be small inclusions and none of them were deep laps or seams or cracks that would be detrimental to the finished part, the material would be considered satisfactory. A chemical analysis would also be required to determine that a high sulfur type of free-machining steel had not been substituted for a part where the low sulfur steel is specified. It was found that due to the uniformity of rolled stock, it was not necessary to examine so many samples when the same problem was encountered later on.

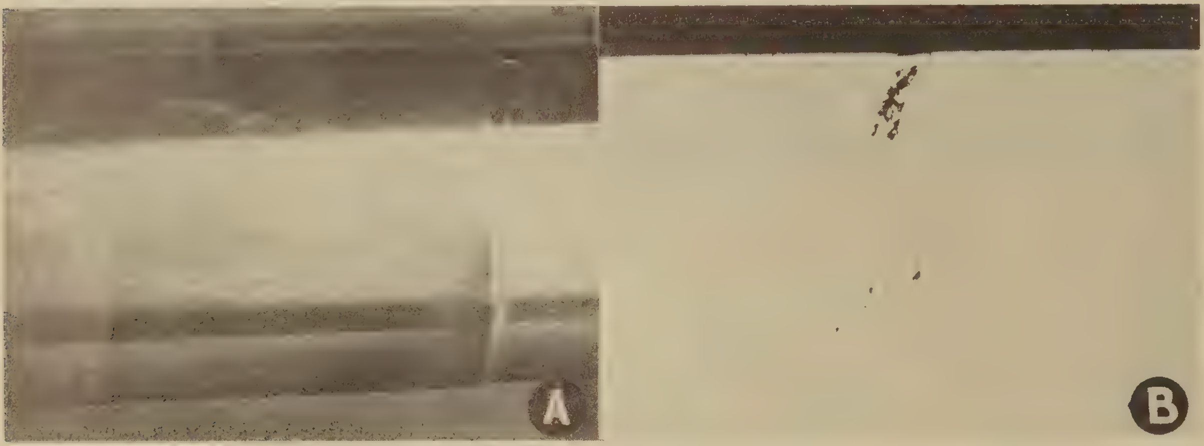

FIG. 3 - On the top center of the chromium plated piston rod shown in (A) are two typical magnetic indications. As seen here, indications on tubing always run at a slight angle to the tube due to the twisting action in piercing tubes. (B) is an unetched cross section through this indication at 100X. The black, jagged inclusion that caused this indication may readily be seen. The hard chromium plate on the surface of the part is visible and a few more inclusions farther down into the metal may also be detected.

For flash butt resistance welds with magnetic indications, which is often the case when materials of different hardenability are welded together, physical tests are also resorted to. An ideal situation would be to weld only parts made from the same heat of material, but since it would be impossible to obtain forgings from one company and tubing from another from the same lot of steel, the entire weld cross-section might be pull-tested; if it is too large, it would be cut up into sections and each section tested. If the part has satisfactory static strength for the use intended, and uniform strength relative to the base metal, the parts are considered satisfactory for further testing. A life test may be required to determine the effect of the indications on the fatigue life of the part.

Fig. 4 is an illustration of such a test on a landing gear outer cylinder with three flash

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[1] AIBNRM publication "Fasteners," vol. 1, No. 2, 1944.

[2] Ibid, vol. 1, No. 3, 1944.

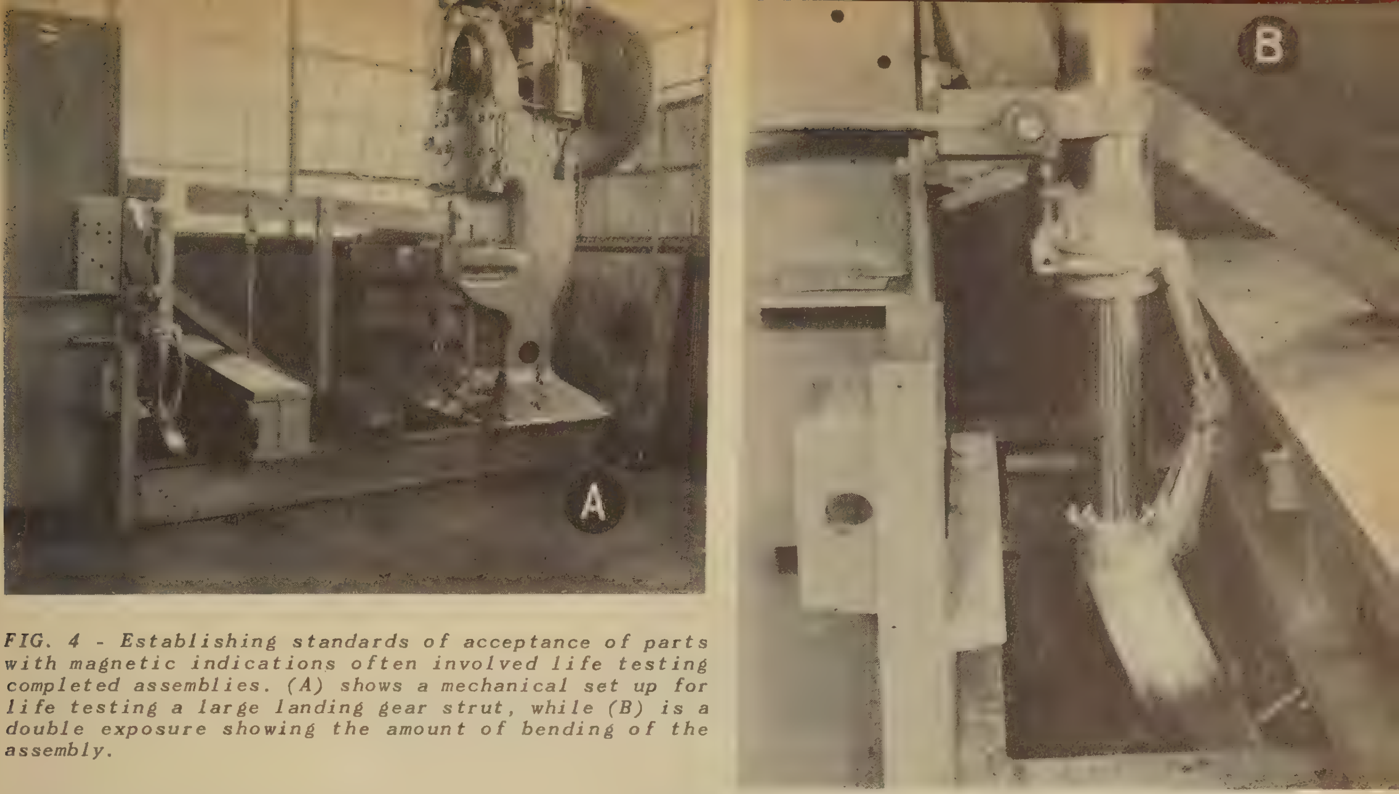


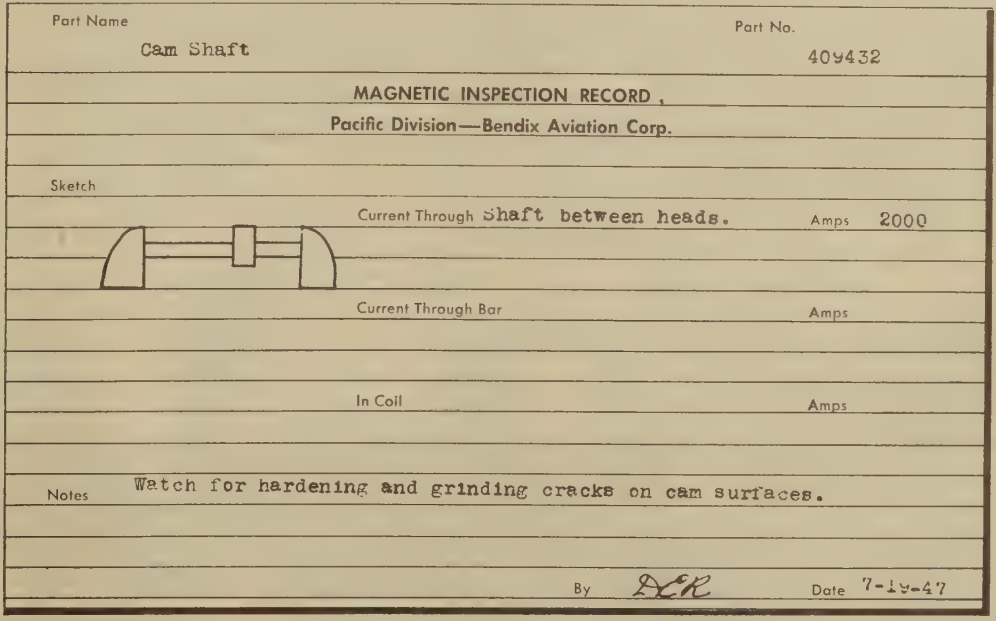
FIG. 4 - Establishing standards of acceptance of parts with magnetic indications often involved life testing completed assemblies. (A) shows a mechanical set up for life testing a large landing gear strut, while (B) is a double exposure showing the amount of bending of the assembly.

welds. The welds are located above and below the pivot forging and at the upper forging and lie within the polished areas on the main cylinder. It was desired to learn whether or not small sharp indications would grow in size and cause failure or leakage from the cylinder. It is interesting to note that upon completion of the test, there was no failure or change in the flash welds but other points of failure were found.

Examples of fatigue failures are often taken from tests like these that far exceed the actual life of the part, and are seldom taken from parts that have failed in service. Tests on finished assemblies with magnetic indications might include life test on a hydraulic test stand where the load is applied hydraulically or operation at low temperature, or fragmentation tests or drop tests which are often required for hydraulic equipment. However, most of the information about magnetic indications is obtained with the help of the metallurgical microscope. The results of these tests are written up as reports or specifications which include standards for magnetic inspection for the parts involved.

A convenient method for keeping a record of the results of magnetic inspection tests is the card file system shown in fig. 5. It provides a space for a record of the proper method of inspection and a place to note the type of defects found or to list any specification or reports that have been written pertaining to that part. Scotch tape records of actual indications may also be taken and fastened to the backs of cards for standards of acceptance or rejection. The cards are filed by part number and are pulled out and checked over each time a new lot of parts are received for inspection.

In a subsequent issue of THE IRON AGE, the author will discuss methods for establishing acceptance and rejection magnetic inspection standards for various classifications of parts.—Ed.



Part Name Cam Shaft
Part No. 409432

MAGNETIC INSPECTION RECORD
Pacific Division—Bendix Aviation Corp.

Sketch
Current Through Shaft between heads. Amps 2000
Current Through Bar Amps
In Coil Amps
Notes Watch for hardening and grinding cracks on cam surfaces.
By DER Date 7-19-47

FIG. 5 - A convenient method of keeping a record of magnetic inspection experience is the card file system shown above that provides a space for a sketch of the method of magnetization and a place for notes on experience with indications and the disposition of parts with indications.

Getting the Most Out of

Substantial opportunities for improved economy and efficiency lie in the intelligent application of small grinding wheels and points. Too frequently these potentialities are overlooked because of the low cost of these tools, in comparison with standard grinding wheels. This article contains many helpful, practical hints covering the selection and use of these wheels and cites several examples of savings realized through the correct use of mounted wheels and points.

* * *

By E. C. BLEAM
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* * *

Mounted Wheels and Points

WITH portable machines that have a speed range to well over 100,000 rpm, there can be little excuse for operating mounted points and wheels at less than efficient speeds. Yet lost production as measured by material removed and parts produced, resulting from operation at too low speeds, is common. An example was in a plant that was removing the burrs from grooves, slots and holes. Because the machine was of an old design and operated at 22,000 rpm, only 25 pieces per wheel were obtained. By substituting a higher speed machine, 75 parts per wheel were obtained. At the machine's top speed of 105,000 rpm, production was 115 parts per wheel.

Optimum machine speed depends on several factors. Most of them tend to increase the speed. Increasing the speed tends to better the quality of the surface produced. However, each shape and grade of mounted point has a speed at which it tends to burnish the work instead of cutting it. A burnishing action can be overcome by reducing the speed, or better cutting action can be obtained by changing to a softer grade or coarser grit or both.

A wheel that is too soft for the job will impair the finish by breaking down too quickly and grooving. This can be overcome by increasing the speed if it can be safely done. Otherwise, a harder grade or finer grit wheel must be used.

The speed to use is determined in part by the material being ground. If the wheel grade and grit remain constant, the speed can be increased in about direct ratio to the hardness of the material being ground.

The smaller the area of contact between wheel and work, the softer will the wheel act. If the area of contact is small, a higher speed should be used to give a harder action to the wheel. It may be necessary to change speeds in the midst of a job. For example, if it is necessary to grind both the bottom and edge of a blind hole, the edge will tend to wear the wheel excessively because of less area of contact. Raising the speed when grinding the edge of the hole will reduce the wheel wear.

In the effort to get longer wheel life, it is possible to raise the speed too much. The desired goal is to get the best overall speed, considering wheel life, finish and material removal. It is easy to determine whether cutting action is correct. If, after a few minutes operation, the wheel is unevenly worn or dusty, either the wheel is too soft or the speed is too slow. The cure is to use a harder wheel if the speed cannot be raised.

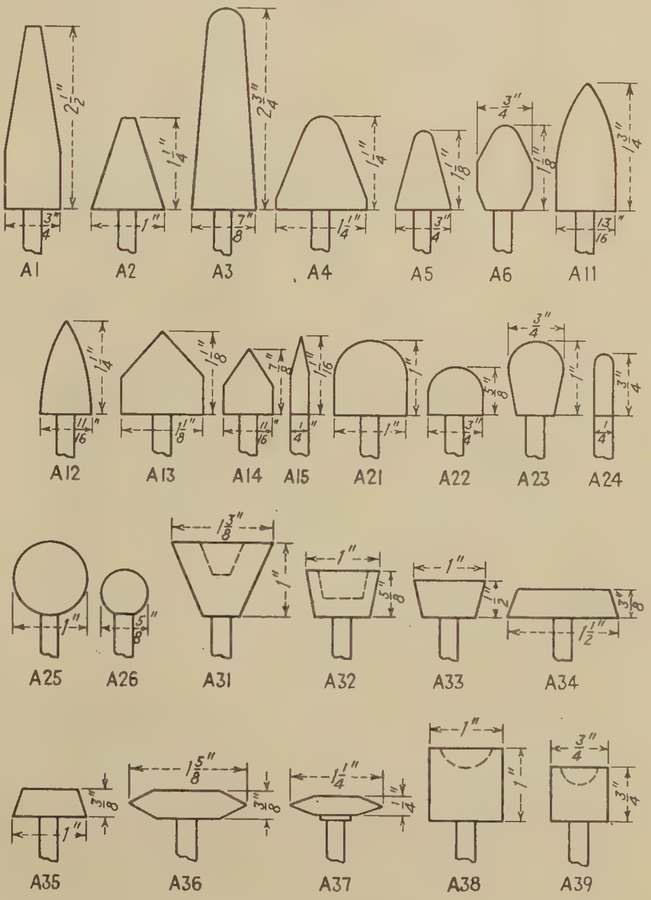
If the wheel shows a sheen and is not loaded, the grade and speed are about right and a good wheel life and cutting action are being obtained.

There is a top speed dictated by safety. A mounted point or wheel can break the same as an ordinary wheel, from centrifugal force. Also, it may fail from breakage or bending of the spindle. This is the critical speed that has been carefully determined for every size and shape of mounted point and wheel. This information is contained in publications of various wheel manufacturers.

The critical speed is not measurably affected by the spindle material or by the short taper and reduced diameter of the spindle to which very small wheels are attached, nor is the critical speed affected by the type or style of machine used, although the condition of the machine spindle and bearings may to some extent modify the critical speed. Greater runout and out-of-balance of the wheel as mounted will decrease the critical speed.

Critical speeds as found are subjected to factors of safety. Those listed in tables in manufacturers publications are for plain unthreaded spindles. Generally for 1/8 in. threaded spindles,

FIG. 1 - Group A - standard shapes.



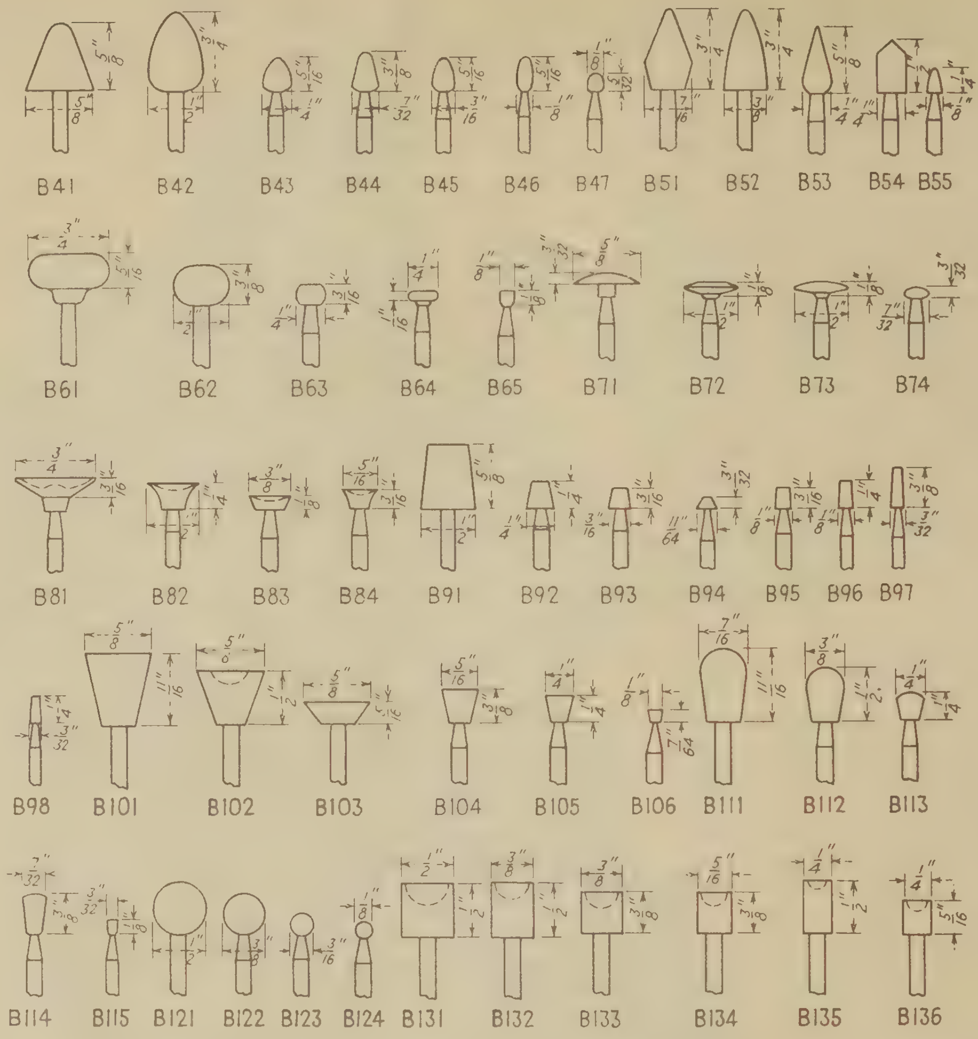


FIG. 2- Group B - standard shapes.

the operating speed should not exceed 50 pct of the critical speed and for ¼ in. threaded spindles it should not exceed 60 pct. Under certain conditions these percentages may be lifted to 55 pct and 65 pct.

All other wheels should be operated at not more than 75 pct of critical speed, except under special conditions when it may be raised to 85 pct.

There are three conditions that affect critical speeds: (1) The dimensions of the wheel; (2) changing either the diameter or thickness of the wheel, and (3) changing the diameter of the wheel spindle. Increasing the distance from the base of the wheel to point of support by the machine lowers the critical speed, and vice versa. This, called the overhang, is lessened by increasing the amount of the wheel spindle that is held in the machine chuck.

By bending or breaking the wheel spindle at speeds below the critical, excessive pressure may be the cause of trouble. It is impossible to measure pressure while the wheel is operating, but an operator can learn from experience if a wheel is free-cutting. Burning is caused by excessive pressure. If, with the speed below the critical, the wheel runs smoothly when free but not so smoothly under load, probably excessive pressure is being used.

Heavy pressure does not increase material removal. It may slow the machine to the point where chatter will exist, thus reducing material removal. Light pressures are better up to the point where the contact is lost with the work. Care in watching the pressure will result in better finish and faster production.

Mounted wheels and points have the following general uses:

1. Deburring parts such as holes, edges of sheets, slots, and gear teeth.

2. Snagging and finishing parts that are hard to get at, such as the spokes and webs of pulleys.

3. Finishing welds, molds, dies and metal patterns.

4. Tool grinding.

5. Burnishing, chamfering, blending, engraving and marking, nicking, drilling, grooving, enlarging, mortising, inlaying, routing, scoring, polishing and rasping.

6. Removing cracks, checks and tool marks in

high speed parts of automotive and airplane engines to prevent fatigue failure. Final finish is given by fiber or rubber wheels.

Mounted points and wheels have possibilities and limitations that are well to know before selecting one for any of these jobs. There may be more than one tool to do any of the jobs listed. The following considerations may point to the selection.

If irregularities or waviness are to be retained on a surface, the finished surface should be produced by a rubber or flexible wheel that will follow the pattern. If the irregularities are undesirable and should be removed, a coarse mounted wheel or point should be used and a fine grit mounted wheel or a flexible wheel can be used in finishing to remove the grinding marks.

If the finish need not be of fine quality, rotary files can be used on either ferrous or nonferrous materials that are not too hard. If the finish must be fine, the file can be followed with a mounted wheel or point.

The edges of cold-rolled steel or aluminum sheets may be broken with either mounted wheels or files. Files are usually preferred for aluminum sheets because the material is so soft. It will not dull the file but may load the wheel, interfering with material removal.

It is important to select the right mounted point or wheel to do a job. The wheel must be of the right shape and correctly selected as to type of abrasive, grit size, type of bond and grade. Operating conditions as to speed and pressure must of course be correct.

The accompanying illustrations show 84 standard shapes of points and wheels. There are also 98 other type W group sizes. From the selection shown it should be possible to get one best suited to any job, but poor performance is often the result of choosing the wrong shape of point.

A common job, found in many shops, is chamfering oil holes. Numbers B121, B122, B123, B124 and B125 are designed specially for this job. They will do it efficiently and give proper production before wearing out. But often a tapered point like A15 or B53 is used for the purpose. Light pressure of the point against the sharp edges of the oil hole will groove the point so much that it cannot be used because it throws up a counter burr.

To alter the shape of an ill-adapted point by dressing is a mistake often made when a standard point would do a better job if selected in the first place. This may be expensive in wasted abrasive material and the work of dressing the new point to the desired shape. A typical case can be cited involving the burring of the edges of a small part that had been flame hardened to a Rockwell 60-64. The correct wheel to use was a number W144, a ⅛ in. diam ¼ in. thick plain mounted wheel. The bond that should be used was vitrified. New, the wheel cost 50¢.

B104 was the one that the operator thought should be used for the job. It happened not to be in stock at the time. So the operator took a resinoid B122 and dressed it to a B104 with an expenditure of 25¢ in labor. The total cost of the resinoid wheel, together with the labor put in upon it, made a total cost for labor and material of $1.55.

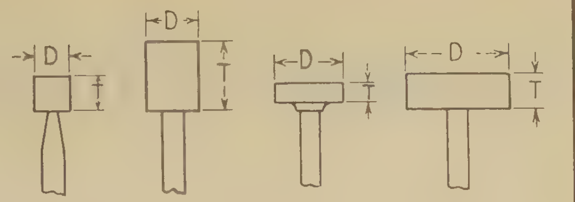


FIG. 3 - Group W - plain shapes.

Another case of choosing the wrong wheel was in grinding a blind hole that formed a sharp corner where the side joined the bottom face. The wheel designed for such a job is an A31 point with a countersunk end. The one selected was a straight wheel, No. W237. In the effort to get a square bottom corner, a bell-mouth hole was produced and the wheel was ruined by excessive pressure.

Obviously it is not possible to name all of the uses for all of the mounted points and shapes. It is, however, possible to give a fairly typical list that can be kept where it may be consulted by workmen.

Following are uses for which various shapes of mounted points and shapes are designed:

A1, A2, A3: Cleaning castings and heavy, large parts.
A2, A4, A5, A6, A12: Large work, dies, taper holes.
A13, A14: Trueing and finishing chamfered oil holes, dies.
A15: Very small holes or corners, holding and sharpening the point like a pencil.
A21, A22, A23, A24, A25, A26: Chamfering and burring holes, cleaning holes in dies, forming and finishing radii.
A31, A32, A38, A39: Cleaning blind end holes. The countersunk end prevents the formation of a "dead-end" surface design, which is often objectionable.
A33, A34, A35: Cleaning sharp angles.
A36, A37: Slotting and nicking.
B41 to B55: Tool and die work.
B51, B52: Internal form grinding.
B61 to B65: Grinding radii and grooves.
B71 to B74: Nicking and slotting, gear tooth breaking.
B81 to B84: Nicking, slotting, cleaning angles and blind end holes.
B91 to B98: Hard to reach spots where end of wheel must be relieved.
B101, B102: Blind end holes and sharp angles.
B103 to B106: Tapers and sharp angles.
B111 to B115: Grooves and radii.
B121 to B124: Burring oil holes, grinding radii, polishing curved surfaces.
B131 to B136: Blind end holes.

In a general way the W shapes have about the same uses as the A and B shapes of points. They can be dressed, if needed, to nearly any form, the larger ones being more versatile than the A and B shapes when a larger wheel is required. They are also used for internal grinding.

(Continued on page 144)

Strength Limitations in the Use

Utilizing the standard tensile test and the static notched-bar tensile test, the authors investigated the suitability of SAE 4340 steel for applications undergoing exposure to various service conditions. Results of the study, described in this article, include physical property data for SAE 4340 heat treated commercially, as compared with laboratory (ideal) heat treatment. Quantitative data is also presented indicating the effect of tempering temperature on regular tensile properties as well as notch properties when testing at room temperature and at –70°F.

HEAT-TREATED low alloy steels have been used extensively in the manufacture of structural parts that are subjected to severe service conditions such as multiaxial loading, etc. Since many of these structural shapes are quite large, one of the most popular steels for these applications is the SAE 4340. This steel has also been particularly useful in aircraft work.

In one application, however, a large forging of this steel was found to behave in a somewhat brittle manner and it failed at a load much lower than would normally have been expected. An examination of this premature failure seemed to indicate that the fracture initiated at a fillet which connected a flange with the main body of the forging, although a fillet radius had been provided at this junction.*

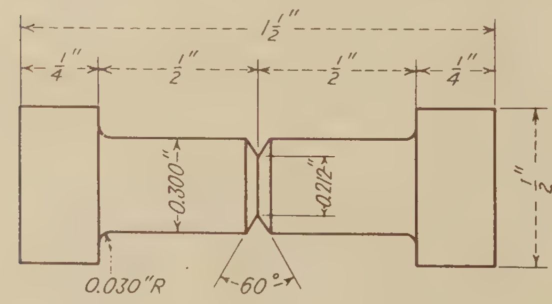


FIG. 1 - Notched tensile specimen.

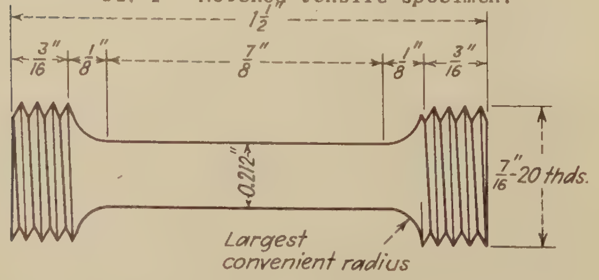


FIG. 2 - Unnotched tensile specimen.

In order to determine the cause of failure, an extensive study of the part was undertaken. Since in many commercial failures the source of difficulty is several-fold, the investigation was conducted from several independent approaches. The first of these was a design problem involving an examination of the design features at the locus of failure; the second was a metallurgical problem involving (1) the determination of the properties of this material under severe stress conditions when subjected to ideal heat treatments, and (2) the determination of these properties when the material is heat treated commercially.

The ultimate evaluation of any heat treatment lies in the manner in which the heat-treated part performs under service conditions. However, full-scale testing is both uneconomical and time-consuming in many cases. Consequently, a suitable laboratory test can be used to great advantage in cases where full-scale testing is impractical.

Static notched-bar tensile tests have been used previously to evaluate differences in low alloy steels heat treated to identical strength (or hardness) levels,[1] to determine basic properties of weldments,[2] to evaluate section size effects,[3] and to determine the effect of fiber direction.[4] The test consists of applying a static tensile load to specimens of rotational symmetry, fig. 1, with

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** The structural part in question had essentially a circular cross-section, but possessed a varying cross-section along its length. Furthermore, one end member was forged into a flange, the plane of which formed an angle with the longitudinal axis of the part. The forging was loaded in such a manner that the axis of loading was coincident with the longitudinal axis of the member.*

# of SAE 4340 Steel Forgings

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Cleveland

various degrees of induced multiaxial stress. The various stress states are introduced by an angular notch which produces lateral restraint to plastic flow in the notched section. The more fundamental aspects of the development of the test have been previously investigated in detail.[5, 6, 7]

The usefulness of the notch bar tensile test lies in the fact that it affords a convenient vehicle for approximating a material's ability to withstand severe service conditions. The stress and strain states present at the root of the notch are quite similar, for example, to those in load-carrying members in which sudden section size changes are present, or in which sharp corners are present. Furthermore, additional embrittling factors, such as eccentric loading[5] and low temperature[3], may be superimposed on the notch test to provide any desired degree or method of embrittlement.

The particular type of notched specimen which has been shown to reveal the largest difference in heat-treated low alloy steels[6] is one in which 50 pct of the cross-section has been removed by a 60° V-type notch, with a very small radius (less than 0.001 in.) at the notch bottom. In these tests, the load was applied axially at room temperature.

As a result of the geometry of the selected specimen, the strength of the notched specimen (*the ratio of the maximum load observed in testing to the original cross-sectional area at the root of the notch*) should be 1.5 times its ordinary unnotched tensile strength if the material has sufficient ductility (*contraction in area at fracture at the root of the notch*) to overcome the embrittling effect of the notch. Any deviation from this 1.5 relationship indicates that the condition of the material is such that it is unable to eliminate the damaging effect caused by the notch. From this relationship between notch strength and tensile strength, it is usually more lucid to plot the notch strength functions of both tempering temperature and tensile strength.

In plotting the notch strength as a function of the tensile strength, the deviation of the notch

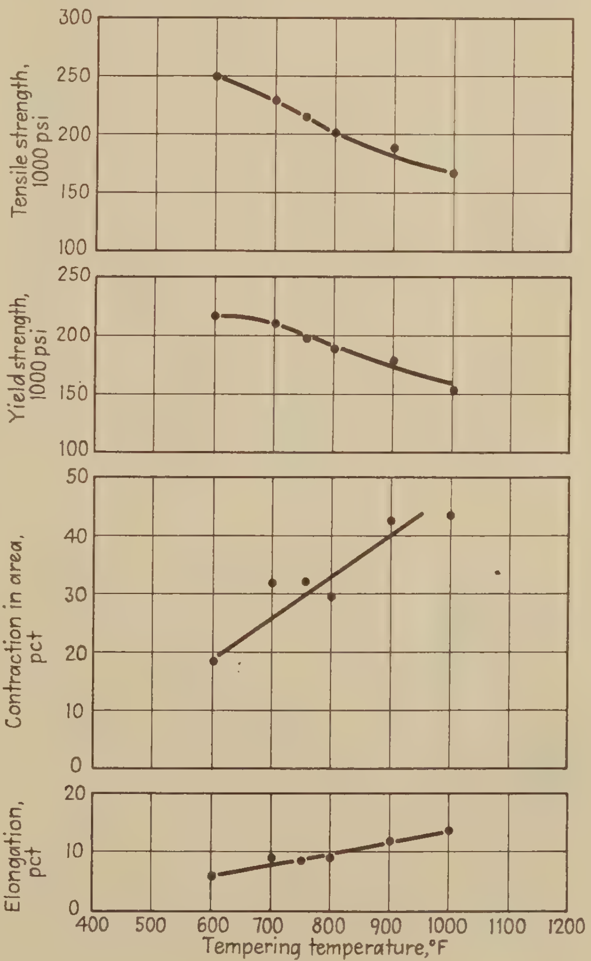

FIG. 3 - Effect of tempering temperature on regular tensile properties of SAE 4340; 45° to fiber; parallel to longitudinal axis; reheat treated before tempering.

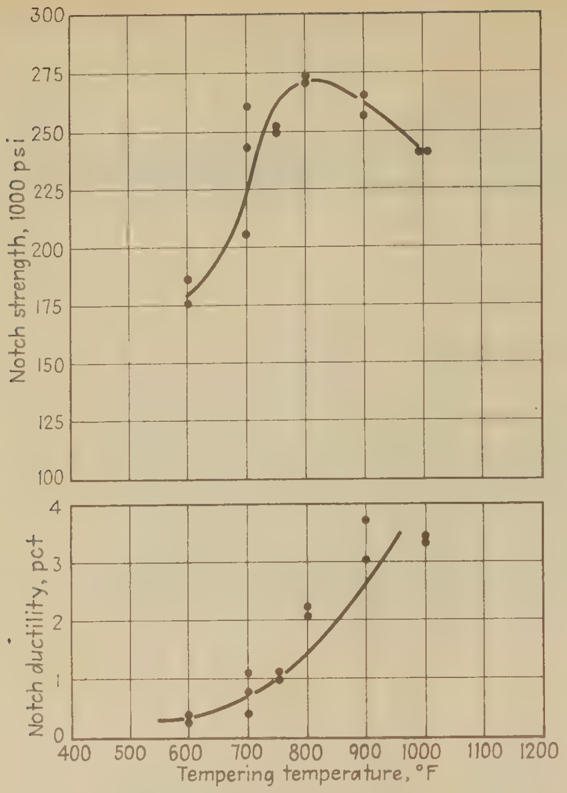

FIG. 4 - Effect of tempering temperature on notch properties of SAE 4340; 45° to fiber; parallel to longitudinal axis; reheat treated before tempering.

strengh from 1.5 times the tensile strength, usually takes place at strength levels between 165,000 and 185,000 psi for the low alloy steels. The notch strength, after deviating from the 1.5 line, passes through a maximum after which the notch strength drops rapidly with increasing hardness. Strength levels up to this maximum value are considered safe in the presence of severe stress raisers while strength values greater than this are considered unsafe.

Because of the previous success in the use of this test and this type of specimen, an attempt was made here to evaluate the effectiveness of a commercial heat treatment of a large forging as compared with a laboratory (ideal) heat treatment.

4340 Heat Treated Under Ideal Conditions

When the properties obtained on a large commercial forging are compared with those obtained on small products (for example, rods) treated under laboratory conditions, it is not possible to determine whether the property differences originate from the different inherent characteristics of the sections (e.g., microstructure of rods as compared with that of a large forging) or from the difference between a commercial heat treatment and ideal (laboratory) heat treatments. Since the inherent large section characteristics of a material cannot readily be controlled, it was considered necessary to determine the maximum properties of heavy sections heat treated under ideal conditions in order to compare them with those properties realized under commercial heat treating conditions.

Sections of a fractured forging in the vicinity of the failure were supplied for this investigation. Since, in most complex forgings, it is impossible to make the fiber direction and loading axis the same over the entire length of the piece, these sections were etched in order to determine the relationship between the fiber direction and the loading axis. The fiber was revealed to be at a 45° angle to the longitudinal direction of the forging so that in order to have a large number of specimens close to the failure and all in the same direction with respect to the fiber, the specimens were taken at 45° to the fiber, or parallel to the longitudinal axis of the part.

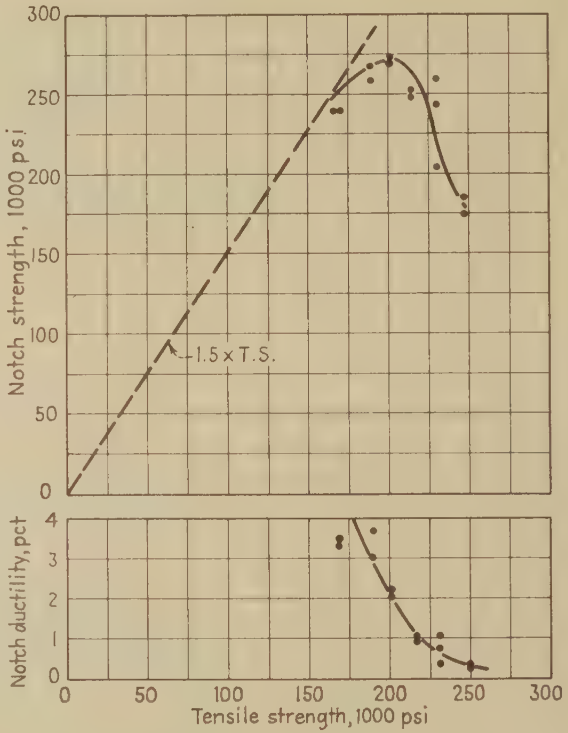

FIG. 5 - Notch properties as function of strength level for SAE 4340; 45° to fiber; parallel to longitudinal axis; reheat treated before tempering.

The material used to establish the properties of this steel under ideal (laboratory) conditions was heat treated in 1½ x ½ x ½ in. sections as follows:

(1) Normalize to 1675°F for ½ hr, air cool.
(2) Stress relieve at 1200°F for 4 hr, furnace cool. Specimens were then rough machined, including threading, or preliminary cutting of the notch, before
(3) Austenitizing at 1550°F for 1 hr. Oil quench into an air lift type tank.
(4) Draw 6 hr at various temperatures, water quench.

These sections, after machining, were drawn at various temperatures between 600° and 1000°F and tested in tension as both notched and unnotched specimens. The results of the regular tension tests (specimens of type shown in fig. 2) are given in fig. 3. The tensile properties showed an almost linear relationship to tempering temperature over the range studied. The strength and elongation values were quite reproducible, while the contraction in area values showed some scattering.

The notched tensile properties of the material heat treated in small section size are shown in fig. 4 as a function of tempering temperature and in fig. 5 as a function of strength level. The notch strength shows a maximum at a tempering temperature of 800°F (205,000 psi tensile strength).

Properties of 4340 Heat Treated Commercially

In order to determine the properties of the commercially heat treated material, it was assumed that no difficulties were introduced by the commercial tempering. The heat treatment used in the commercial production of this part consisted of:

(1) Normalize to 1650°F for 2½ hr and furnace cool.

(2) Hold at 1550°F for 2½ hr, and oil quench in circulating oil at 110°F; at approximately 475°F, the piece was transferred to the draw.

(3) Draw at 800°F for 3 hr and air cool; repeat draw.

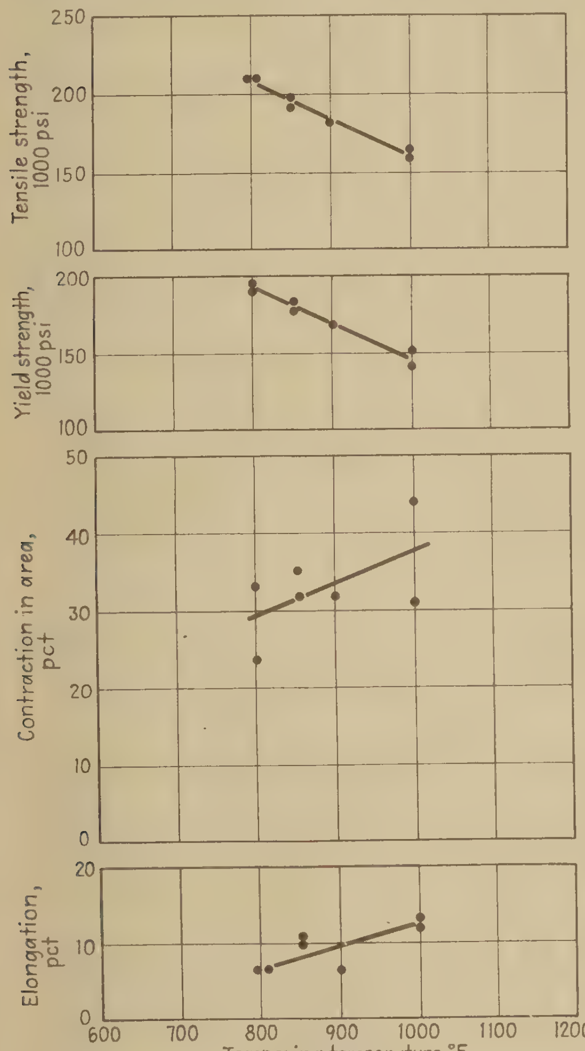

FIG. 6 - Effect of tempering temperature on regular tensile properties of SAE 4340; 45° to fiber; parallel to longitudinal axis; commercially heat treated and subsequently retempered.

The commercially heat-treated material was retempered at various temperatures (above 800°F since this was the commercial tempering temperature) to establish the notch bar tensile properties of the commercially hardened material as a function of tempering temperature and strength level. The results of the regular tension tests are given in fig. 6. The tensile properties again showed a linear relation to tempering temperature over the range studied with the strength values again being quite reproducible, while the ductility values scattered considerably. The results of the notched tension tests are plotted in fig. 7 as a function of tempering temperature, and in fig. 8 as a function of strength level.

The curves obtained on the completely reheat treated material are added to figs. 7 and 8 as an aid in making comparisons based on the same tempering temperature and on the same strength level. From these figures it can be seen that a reduction in the heat-treated section size increased the maximum notch strength from about 260,000 psi to 270,000 psi. However, the more important conclusion to be drawn from this comparison is that the strength level at which the maximum notch strength is obtained was increased from approximately 190,000 psi to about 205,000 psi (or the safe tempering temperature was decreased from 850°F to 800°F) by a decrease in the heat-treated section size.

Since the structure, of which the forging being studied was a part, would probably be subject

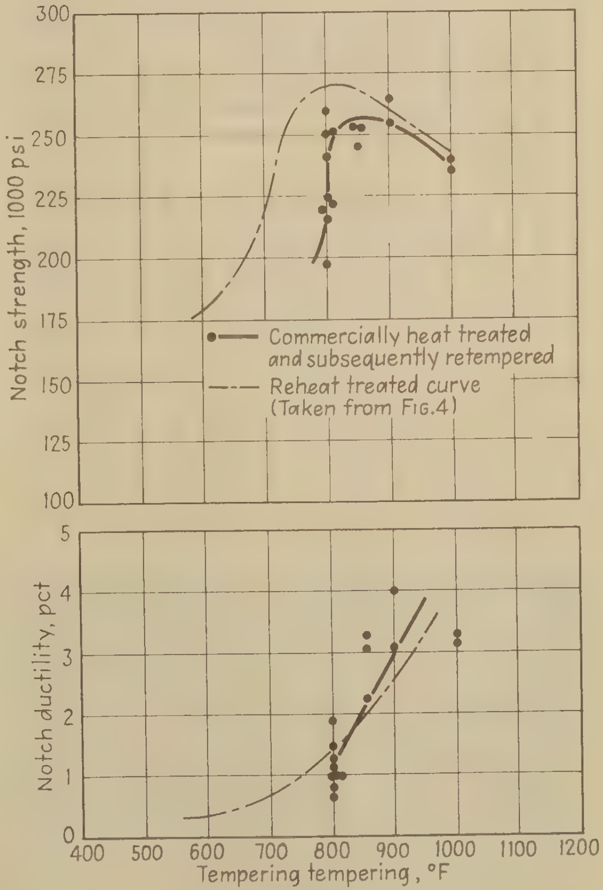

FIG. 7 - Effect of tempering temperature on notch properties of SAE 4340; 45° to fiber; parallel to longitudinal axis.

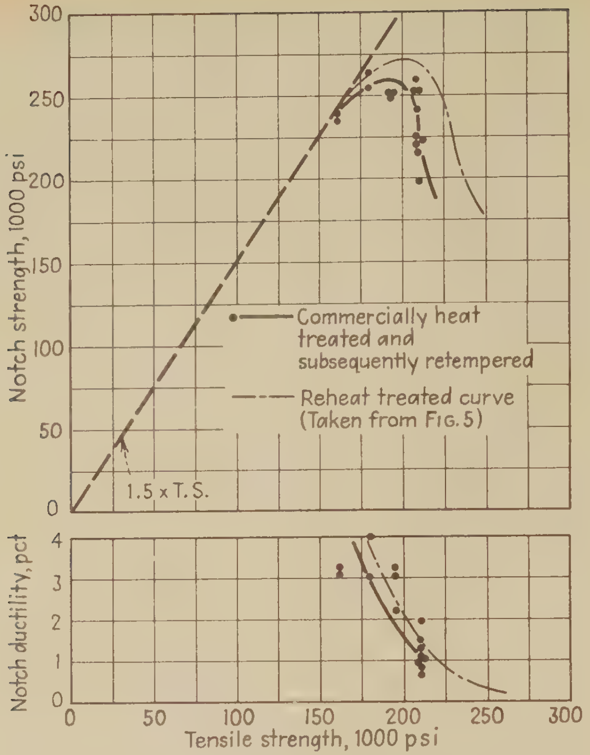

FIG. 8 - Notch properties as a function of strength level for SAE 4340; 45° to fiber; parallel to longitudinal axis.

to service at relatively low temperatures, it was considered advisable to determine the properties of the material at low temperatures.

From the information available on the effect of (low) temperature, it could be postulated that a decrease in temperature constitutes an embrittling agent in much the same manner as an increase in hardness or the addition of a stress raiser. Under these conditions, it would be expected that the material would become more brittle and that the safe tensile strength, to which the material should be tempered for use under conditions of multiaxial stress, should be decreased as the testing temperature is decreased.

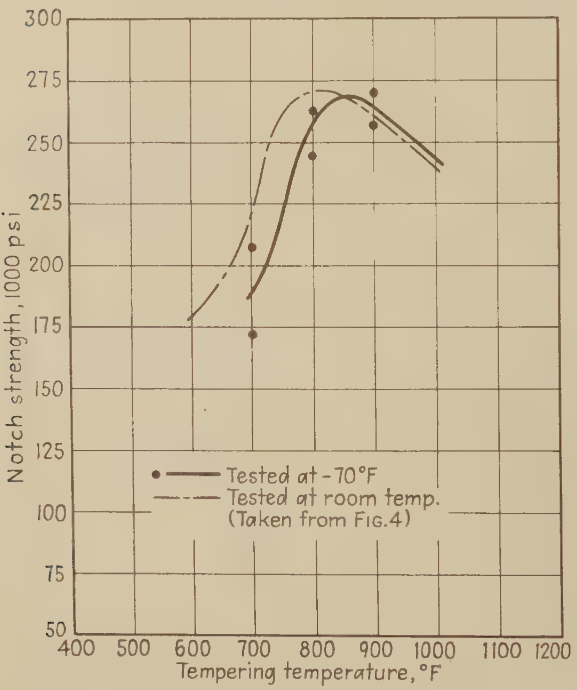

FIG. 9 - Effect of tempering temperature on the notch properties of SAE 4340 when tested at -70°F; 45° to fiber; parallel to longitudinal axis; reheat treated before tempering.

In order to ascertain the validity of the above concepts and obtain some qualitative data on the magnitude of the effect, notched bar tensile tests were conducted on the steel at a temperature of —70°F. The material was tested in the more or less ideal conditions of laboratory heat treatment in small sections. The results of these tests are shown in fig. 9 as a function of tempering temperature and in fig. 10 as a function of strength level (tensile strength).

As was expected, the maximum safe tensile strength was reduced by approximately 20,000 psi (205,000 to 185,000 psi), which corresponded to an increase in tempering temperature of approximately 50°F (800° to 850°F).

It is well known that the utility of any laboratory test lies in its ability to reproduce commercial conditions. In this particular case, the proof of the usefulness of the laboratory test was determined by the fact that slight alterations in heat treatment on the basis of the laboratory tests, together with the recommended design changes, completely eliminated the premature failures of the forging.

As a result of the laboratory tests on a large forging of SAE 4340 steel, the following conclusions can be drawn:

(1) It appears that the static notched bar tensile test can be used to determine the safe strength level at which SAE 4340 steel can be used under conditions of severe stress raisers.

(2) The maximum strength level at which ideally heat-treated SAE 4340 heavy steel forgings can be used safely under severe service conditions appears to be 205,000 psi. This corresponds to a tempering temperature of 800°F, as was determined by static unnotched bar tensile tests.

(3) Because of the difficulties encountered in heat-treating large sections, it appears that the safe strength level for heavy SAE 4340 forgings (to be used under conditions of severe stress raisers, etc.) is 185,000 psi. This corresponds to a tempering temperature of 850°F, as determined by unnotched bar tensile tests.

(4) A reduction in testing temperature from room temperature to —70°F necessitates a decrease in tensile strength from 205,000 psi to 185,000 psi for ideally heat-treated heavy SAE 4340 steel forgings.

(5) If this material is used under conditions where the absence of severe stress raisers can be insured, it should be possible to use a slightly higher strength level than the values given above.

(6) The tests discussed were all made on specimens taken at 45° to the fiber direction of the forging. It is expected ,that the maximum safe strength level would be increased if the axis of the test specimens were made coincident with the direction of the fibering while it would probably be decreased if the fiber direction and specimen axis were perpendicular.

The authors acknowledge the assistance of R. C. Gazley, assistant chief engineer, Cleveland Pneumatic Tool Co., George Sachs, director, Research Laboratory for Mechanical Metallurgy, Case Institute of Technology, and O. Hoffman, associate professor, Department of Civil Engineering and Engineering Mechanics, Case Institute of Technology, in the development of this article.

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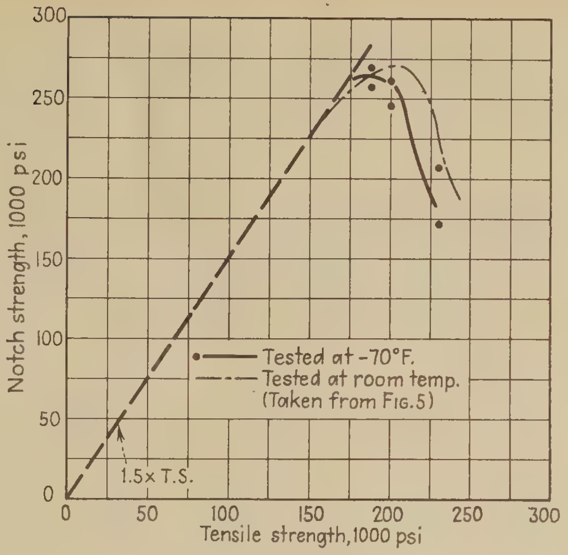


FIG. 10 - Notch properties as function of strength level for SAE 4340 when tested at -70°F; 45° to fiber; parallel to longitudinal axis; reheat treated before tempering.

6 G. Sachs, J. D. Lubahn and L. J. Ebert, "The Effects of Notches of Varying Depth on the Strength of Heat Treated Low Alloy Steels," Trans. ASM, vol. 34, 1945, p. 517.

7 G. Sachs and J. D. Lubahn, "The Effect of Triaxiality on the Technical Cohesive Strength of Steels," Journ. Applied Mechanics, vol. 12, 1945, p. 241.

Straightening Machine Offers Flexibility

A TUBE and bar straightening machine, quickly adjustable for size, has been engineered and built by the Sutton Engineering Co., Bellefonte, Pa., for the National Supply Co., Ambridge, Pa. The machine handles a wide range of sizes, in tubing ranging from 5½ to 18½ in. OD. Solid bars up to 12 in. diam can be straightened with this equipment.

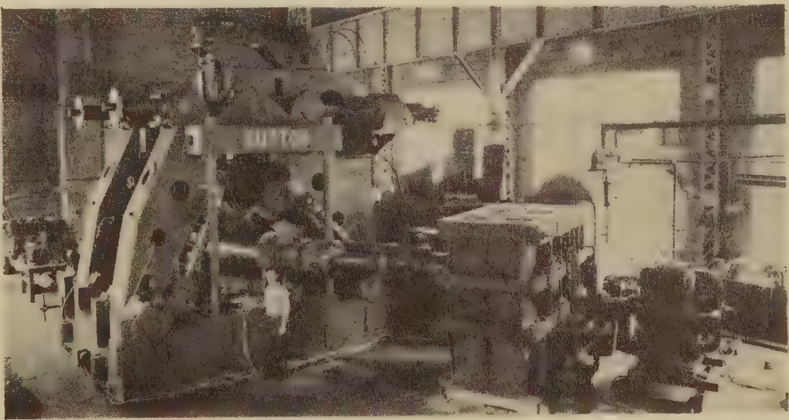
This particular machine, shown in the accompanying illustration, is designed for a maximum roll opening of 14⅜ in. OD. In a demonstration at the Sutton Engineering plant a changeover from 5½ in. to 13⅜ in. tubing required only 1 min 45 sec.

The straightening machine operates with seven rolls, clusters of three rolls at the entering and leaving sides of the machine, and a center straightening roll. There is a driven roll in each cluster, with power applied through a speed reducer. The driven roll is located below two idler rolls, making it unnecessary to use an adjustable table.

The idler rolls are adjustable for tubing and bar size by means of motor driven screw-down arms operating through speed reducers and controlled by push buttons. The center straightening roll also operates through a speed reducer that is push button controlled.

Straightening speeds range from 50 to 200 fpm with a 250-hp motor operating at 300 to 1200 rpm. Screw down motors are 5 hp, series wound, 900 rpm, mill type. The machine is equipped with Timken bearings. Its estimated weight is 150 tons.

The straightening machine has been designed for maximum operating flexibility. Several methods are provided for adjustment of the position of the idler rolls so as to minimize the frequency of redressing; however all rolls are readily removable for redressing when necessary.



A tube and bar straightening machine that is capable of handling tubing ranging from 5½ to 18½ in. OD and solid bars up to 12 in. diam.

Lock Washer Torsion Test Improved

APPARATUS that gives accurate and reproducible results, superior to the SAE vise and monkey wrench method for torsion testing of lock washers, has been developed by the Westinghouse Electric Corp. The development does not introduce a new test, but rather refines testing equipment for conducting the accepted torsion test.

The SAE testing procedure leaves much to be desired as far as uniformity of test method between operators and duplication of results is concerned. Variables include (1) the percentage of washer falling outside the jaws of the vise (2) the exact angle, through which the washer is twisted before fracturing (3) the grip of the monkey wrench on the washer.

These variables have been a sore point when the manufacturer questions a rejection of lockwashers due to failure on the torsion test. These variables have been eliminated by the use of a specially designed vise with a built-in protractor, special wrenches, and two sets of gages. These gages are calibrated for different sizes of lockwashers. One gage fits between the jaws of the vise so that the lockwasher can be placed on the appropriate step. The other gage is placed on the level corresponding to the diameter of the washer. This leaves the exact prescribed circumference of the washer free for twisting between vise and wrench. The angle at which failure occurs can be readily determined from the protractor scale on the vise. The testing apparatus is shown in fig. 1; and an actual torsion test is shown underway in fig. 2.

The new testing apparatus has been used for the last two years for the routine inspection of all lockwashers received in the Westinghouse East Pittsburgh Works. During this time, suppliers have not questioned the validity of the test and rejections have been accepted without argument.

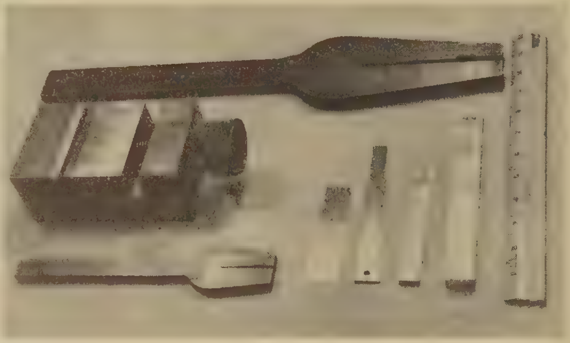


FIG. 1 - Apparatus for Lock Washer Torsion Testing.

FIG. 2 - A lock washer undergoes the refined Torsion Test.

In addition, this equipment is used for the torsion testing of lockwashers after electroplating to insure that the washers have received the stress relief treatment for hydrogen embrittlement which often accompanies plating.

Cylinder Repaired By Welding

WHEN a 1000-ton hydraulic-press cylinder failed because of wear, it was decided to rebuild the bore by the Unionmelt welding process. The saving on this job more than paid for the complete welding installation as well as the accessory positioning equipment, labor and materials.

A Unionmelt Type D welding head was mounted on an extension arm so that the head could enter the full length of the cylinder. The cylinder, which was 24 in. ID by 15 ft long, was laid on turning rolls driven through a reduction gear by a variable-speed electric motor by which it was rotated at a speed of 8 to 10 ipm. The welding head was advanced manually a given distance after each revolution. The advance was easily measured by a tape attached to the side of the track.

It was necessary to preheat the cylinder before welding since both the welding rod and the base metal were of high-tensile steel. The rebuilding operation required 915 lb of steel rod deposited in three layers producing a total thickness of about ⅞ in. After welding, the cylinder was stress-relieved before machining to original dimensions. This left a ¾ in. layer of weld metal lining the cylinder.

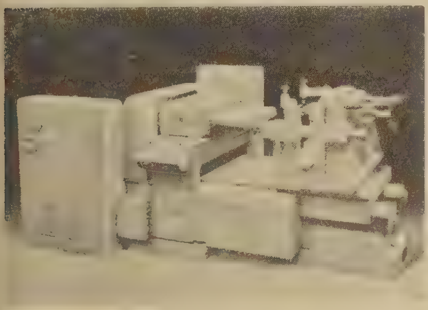
A comparison of costs is particularly interesting. Since it would have taken about a year to obtain a new clinder, it was clearly a question of repair or get-along-without. A new cylinder of this type costs about $5500, to say nothing of the expense of lost production. The total cost of the welding installation, auxiliary equipment, materials, and labor (176 man-hr for a welding operator and helper) comes to only about 25 pct of this amount. Further, the company was able to amortize all equipment, material and labor costs on this one job alone. This installation will continue in use for general repair, building up mill rolls, hammer mill bores and cylinders of all types.

New Production Ideas . . .

Boring machines, railroad shop presses, grinders, a gear and cam shaft checker, a mercury cathode analyzer, synchronous motors and generators, hydraulic pullers, turning rolls, and a magnetic pulley are new and improved products described this week. Flask handling hoists, metallic gaskets, nylon-coated cable, and a liquid wax lubricant are also featured.

Boring Machines

PRECISION boring, facing, turning, chamfering or grooving operations on large, heavy work such as workheads, tailstocks, cylinder blocks, connecting rods, large pump and compressor bodies can be performed on a new series of Bore-Matics added to the line manufactured by *Heald Machine Co.*, Worcester 6, Mass. To accommodate heavy, awkward work of this character the table is built low to the floor permitting easy loading from conveyer or overhead crane.



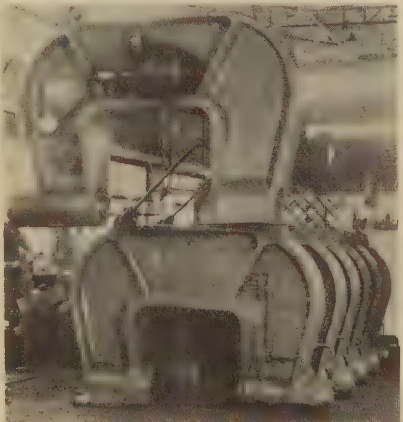
Seven or more individual boring-heads or a special multi-spindle head unit to suit the job can be installed on each bridge. Roughing and precision finishing can be performed at a single setting. These new models are basically the same machine except for length. Models 521, illustrated, and 522 are standard single and double end machines respectively; Model 524 is a single end machine with long base for extra capacity requirements.

Drill Grinder

A COMPLETE line of new twist drill grinding machines in sizes suitable for sharpening drills from No. 52 to 4 in. has been announced by *Gallmeyer & Livingston Co.*, Grand Rapids, Mich. The CWA double-holder machine illustrated is designed to sharpen standard 2, 3, and 4 flute drills of either straight shank or taper shank type at the standard 59° angle. This machine has capacity for sharpening twist drills from No. 52 to 2½ in. Small drills are ground dry on one side of the machine, large drills wet on the opposite side. The spindle runs in double row precision ball bearings that are capable of resisting heavy combined radial and thrust loads from any direction and in any combination. The machine is equipped with 12 in. diam grinding wheels and with 1½ hp ball bearing motor for spindle drive.

Railroad Shop Presses

FOR forcing locomotive crankpins, a 200-ton portable hydraulic press has been added to the line of hydraulic railroad shop equipment manufactured by *Watson-Stillman Co.*, Roselle, N. J. Designed to conform to current European railroad shop practice, an overhead crane brings the portable forcing equipment to the driving-wheel sets rather than taking them to stationary forcing presses for assembly and disassembly. Capacity of the machine is adjustable by means of a padlocked, bi-pass safety valve from its maximum of 200 tons. A dial gage gives direct reading of pressure at all points in the working stroke. Stop and start push-buttons are standard equipment; speed and position of ram is governed by a lever-controlled operating valve. A welded steel reservoir with sight-level gage is flush-mounted in the frame.



Drilling and Boring Machine

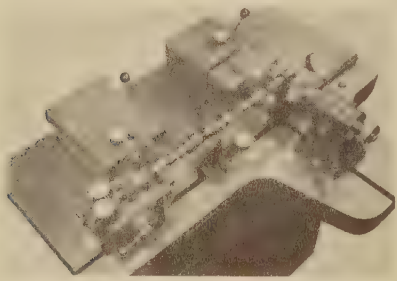
CROSS shaft holes in 70 different sizes and types of clutch housings can be drilled and line-bored on a machine built by *Snyder Tool & Engineering Co.*, E. Lafayette, Detroit. A work piece is manually clamped in each of two stations on a manually rotated standarded index table, mounted centrally between the slides. The two stations permit drilling and boring operations to be performed simultaneously. Fixtures are provided with vertical slide-in-and-out adjustment. Four hydraulically actuated slide units are mounted horizontally and opposed in pairs, front and rear. The rear slides are equipped with single spindle drill heads used to drill the cross shaft holes. Front slides equipped with boring spindles finish line boring the holes. Slide feed rates are controlled by individual feed control valves. Estimated production is 65 pieces per hr at 80 pct efficiency.

Bench Grinder

POWERED by a ¼ hp ball bearing constant speed induction motor, a bench grinder, No. 266, has been introduced by *Stanley Electric Tools*, New Britain, Conn., for light grinding, sharpening tools, buffing, polishing and wire-brush work. It features full ball bearing action, safety type wide wheel guards, adjustable tool rests, and toggle type switch. Guards are adjustable to permit grinding at any point on the circumference of the wheel. Speed at 60 cycles is 3450 rpm. The grinder is furnished with two wheels 6x2 in., on coarse, one fine.

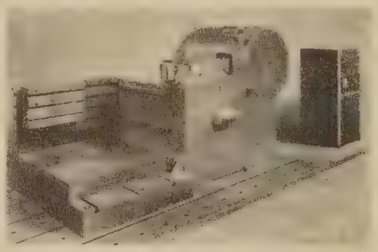
Gear and Cam Shaft Checker

FOR checking cam shaft elements that must be held to close dimensional limits, a machine has been developed by *National Broach & Machine Co.*, 5600 St. Jean Ave., Detroit 13. It checks the oil pump and distributor drive gear, the bearings, journals, and the base circles of the cam lobes. In operation the cam shaft is laid on two journal bearing support blocks and rotated by hand, while readings are taken of the various elements to be checked. The distributor drive gear is tested for composite errors and eccentricity by rolling it with a master gear. Tooth to tooth spacing is checked by a standard Red Ring gear checking head. The timing gear mounting flange is indicated for runout on both faces and the dowel pin in this flange is checked for its relationship to one of the cam lobes. One of the special heads indicates runout on the two center bearing journals and on the base circles of each of the cams.



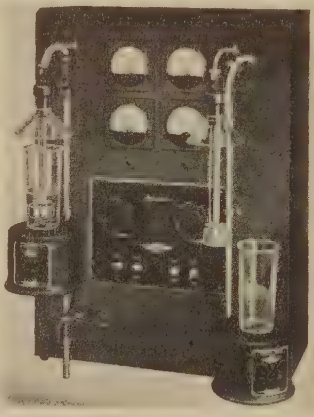
Fatigue Testing Machine

FATIGUE tests of parts or assemblies up to 5x5x5 ft can be made with a 10,000-lb capacity constant force stroking type fatigue machine with strokes up to 8 in., announced by *Baldwin Locomotive Works*, Philadelphia 42. The machine, Model BF-10-U, is a flexible, crank-stroking type in which the stroke is adjusted by a planetary gear system with an independent motor that maintains constant load by varying automatically the distance of a spindle from the center of rotation. The spindle serves as a crank in activating the connecting rod and crosshead that applies fatigue stress to the part under test. This machine can be operated up to 250 cycles per min. Automatic equipment for controlling and indicating load, and recording changes in stroke are contained in a separate cabinet.



Mercury Cathode Analyzer

RAPID electrolytic removal of radioactive metals from aqueous solutions is said to be possible with the Mercalyzer developed by *Precision Scientific Co.*, 3737 W. Cortland St., Chicago 47. The wide range of applied potential, 0 to 10 v, and of direct current, 0 to 10 amp, permits the fast removal of large quantities of reactive metals. The use of magnetic stirring and a surface type mercury cathode hastens the amalgamation of the metals at the mercury surface. Two determinations can be made independently and simultaneously: two amalgamations, two electro-depositions, or one amalgamation and one electro-deposition.



Flexible Shaft Machine

A LINE of light-duty, portable flexible shaft machines, known as Lightnings, has been announced by *Stow Mfg. Co.*, Binghampton, N. Y. The line comprises ¼ and ½ hp 110 v, ac, 60 cycle, single phase motors, with speeds of 1725 and 3450 rpm, mounted on a high pedestal that is convenient for both bench work and shop use. The pedestal rides on an all-steel base with free-swinging casters, making the machine portable around the job or from work station to work station. Both size motors are equiped with 5 or 6-ft flexible shafts, each with a ⅜ in. diam core in a 15/16 in. casing.

Synchronous Motors, Generators

A NEW line of general purpose, Tri-Clad, high speed synchronous motors and generators in "900 series" frame sizes has been announced by *General Electric Co.*, Schenectady 5. The motors are available in standard ratings from 20 to 1000 hp at 60 cycle speeds of 514 to 1800 rpm, in two or three-phase types. Generators are available in ratings from 12½ to 1250 kva. Of drip proof construction, the motors incorporate Tri-Clad features. Direct-connected and belt-driven exciters are available for all ratings.

Dial Comparator

A NEW, heavy-duty dial comparator has been designed by *B. C. Ames Co.*, Waltham 54, Mass., to provide a larger size, precision comparator of greater range and utility, for applications requiring the checking of comparatively heavy parts, and general dimension checking on lightweight parts. Three-button support of the 1-in. thick steel base eliminates rocking of the comparator on the bench. The 1¼-in. diam steel upright post has large diameter locking screws for easy tightening. The indicator bar has its own clamp. The indicator is the Ames Model 202 with lift lever; dial graduated in 0.001 in., dial reading 0 to 100, and a 0.250-in. indicator range. The base is available in any size, which determines the weight of the comparator.

Puller

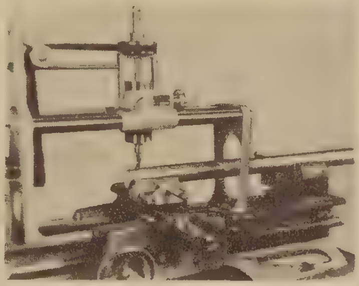
ALMOST any object can be removed from a shaft in a matter of minutes, it is said, with the hydraulic pulley puller manufactured by *Industrial Engineering Equipment Co.*, Davenport 2, Iowa. The puller is portable, and adjustable for height and spread. Pressure is supplied to the hydraulic jack by a hand pump. Three simple adjustments set the puller to the dimensions required. The beams, arms, jack and pump can be removed from the puller stand for overhead or other special uses. Two models are available: the large size, mounted on wheels and exerting 20 tons pressure, and the small size on a flat stand rated at 5 tons capacity.

Turning Rolls

A LINE of improved turning rolls that facilitate the welding of tanks, vessels, drums and pressure and cylindrical vessels, announced by *Ransome Machinery Co.*, Dunellen, N. J., features antifriction bearings in both power and idler rolls in the larger sizes, and a lowered drive to make it easier to load and unload the rolls from either end. Rubber tired rollers absorb shock and cushion seams in automatic welding. Spacing of rollers is adjustable for work of wide range of diameters, and both rollers are driven on power units. The rolls are mounted on carriages which can be driven along tracks at any desired welding speed. Rotation of work and movement of carriage are both accomplished with one motor and variable speed drive.

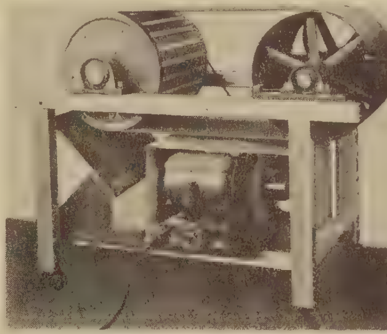
Milling Attachment

A VERTICAL milling attachment developed by *Palmer Industries Inc.*, 6149 South Sangamon St., Chicago 21, can be applied to all makes of bench lathes by removing the compound and installing a vise in its place. The milling attachment is then set on the ways, to which it is clamped from underneath. Adapters are provided for each make of lathe. The unit is driven by the lathe spindle through V belt and adjustable pulleys. Longitudinal feed and cross feed on any lathe are used the same as on a milling machine. The attachment will make a cut 8 in. long on the longitudinal feed and half of the distance of the cross feed. It will take stock up to 3 in. diam under the cutter. End mills up to 1 in. can be used and in some cases 2½-in. circular cutters can be used.



Magnetic Pulley

TO remove fine iron or less magnetic particles and afford automatic separation of ferrous from nonferrous material ranging in size from 10 to 200 mesh, a new type magnetic pulley has been produced by *Eriez Mfg. Co.*, 571 Commerce Bldg., Erie, Pa. The unit, known as the Puri-Pulley, is non-electric and its strength is concentrated in close to the face plate. At 1 in. from the pulley's surface, the magnetic field is approximately three times as strong as a standard pulley. Design characteristics, as well as Alnico material accounts for additional strength. The effective cleaning surface has been increased by narrowing the air-gaps and increasing the number of pole plates. Designed for use as a head pulley in belt conveying systems, the unit is available in 18 and 24 in. diam and in belt widths ranging from 12 to 60 in.



Flask-Handling Hoist

JIB - TROLLEY - MOUNTING of an electric hoist equipped with a special pick-up device provides rapid and safe flask transportation in large foundries, *Yale Towne Mfg. Co.*, 4530 Tacony St., Philadelphia 24, has announced. The pick-up device consists of a 4-in. flat, pulleys bolted to each end of the flat, link chains which pass over the pulleys and engage flask knobs, and a triangular metal piece welded to the center of the flat and drilled so as to engage the hoist hook. The handling mechanism is used in transporting flasks from molding to pouring locations and from pouring locations to shakeout areas. Arrangements such as these can also be designed for forging, machining, storage, and shipping operations.

Metallic Gaskets

GASKETS fabricated of light gage brass, copper, lead, nickel, Monel, and other nonferrous as well as ferrous materials have been announced by *U. S. Gasket & Shim Co.*, 203 Hibbard Bldg., Cuyahoga Falls, Ohio, for use in industries using liquid and gas service equipment. They are filled with a soft asbestos to provide maximum sealing and protection against extreme pressure, heat, and corrosion, and are said to withstand temperatures up to 850°F and pressures of 1500 psi. Seal is effected by the yielding, or flow, of the gasket material into the imperfections of the separable mechanical assemblies. These metallic gaskets can be made in any shape or size, and are fabricated to meet any specifications. Location of bolt holes is held to within 0.015 in. tolerance.

Nylon-Coated Cable

A NYLON-COATED wire rope, known as Wirelon, has been announced by *Rochester Ropes, Inc.*, Culpeper, Va. The coating on Wirelon is not woven or filamented, but solid. It is said to be exceptionally tough and is unaffected by oils, cleansing agents, alkalies, and such acids as nitric, hydrochloric, or sulfuric in concentration up to approximately 1 pct. Temperature tests show that Wirelon ropes operate at high and low temperatures, retaining their flexibility whether wet or dry. Three types are manufactured. In the first, nylon is extruded onto single strands of wire; the second, more flexible, is made by applying the plastic to the outside of wire ropes already completely formed; and the third in which individual strands are coated with nylon and the coated strands then closed into a finished rope. Wirelon ranges in diameters from 1/32 to 1 in.

Ventilating Heater

VENTILATION and air movement throughout general purpose crane cabs and other isolated spaces, during winter and summer, is possible with the ventilating heater developed by *Lintern Corp.*, 34 Lincoln Ave., Berea, Ohio. It is compact with completely concealed operating parts and electrical connections. An oversize capacity motor and switch are included, together with efficient finned heater strips. The heater will provide a 60° temperature rise at zero of a space 1300 cu ft in size with all recirculated air; a temperature rise of 60° of a 660-cu ft space with 50 pct outside air, 50 pct recirculated; and a temperature rise of 52° of a space 250 cu ft in size with 100 pct outside air, at zero.

Oil Conditioner

A THERMOSIPHON oil conditioner, with no moving parts designed to absorb moisture, acid, and sludge from transformer oil continuously while the transformer is in operation is announced by *Westinghouse Electric Corp.*, 306 Fourth Ave., Pittsburgh 30. The units may be mounted on old or new transformers and are said to maintain properties of transformer oil or Inerteen essentially the same as those of new transformer liquid dielectrics for as long as the absorbent material remains effective. Trial installations are said to show the conditioner holds neutralization number, power factor, dielectric strength, and interfacial tension to proper values for good operating practice with no other reconditioning necessary.

Crane Truck

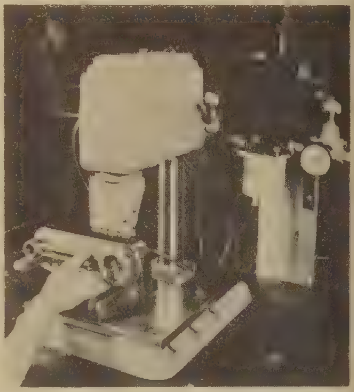
A POWER industrial truck combining a low-lift platform and a crane has been announced by *Elwell-Parker Electric Co.*, Cleveland 14. The crane can pick up a load from floor level and lift it to a hook height of 8 ft, within a radius of 45° either left or right from base. Its shape and mechanism provide means for reaching, high-stacking or taking down raw materials or finished products in such form or package that can be handled with rope or cable slings. The truck's platform can lift and transport loads weighing up to 3 to 5 tons, loads being piled on the platform or on skids under which the platform can maneuver after loading. Crane and platform are operated independently of each other. The boom is 8 ft long, its foot pivoted on a turntable base mounted on the forward end of the truck directly back of the lift platform. The crane's load-lifting capacities range from 1000 to 2000 lb.

Electrical Contact Metal

MARKETED under the trade name Fasaloy 99, an electrical contact metal having the desirable properties of fine silver plus a higher no-weld current value, has been announced by *Fansteel Metallurgical Corp.*, N. Chicago, Ill. Tests show that the contact surface resistance of Fasaloy 99 is no higher than that of fine silver, even when the contacts are subjected to high temperatures or hydrogen sulphide atmospheres. The metal is particularly suited, it is reported, for uses where relatively low operating pressures and high temperatures are encountered, and where circuits of relatively high amperage are made and broken. Contacts will make and break resistance load circuits of as high as 25 pct more current than fine silver, without failure due to sticking or welding, it is claimed.

Automatic Marking Machine

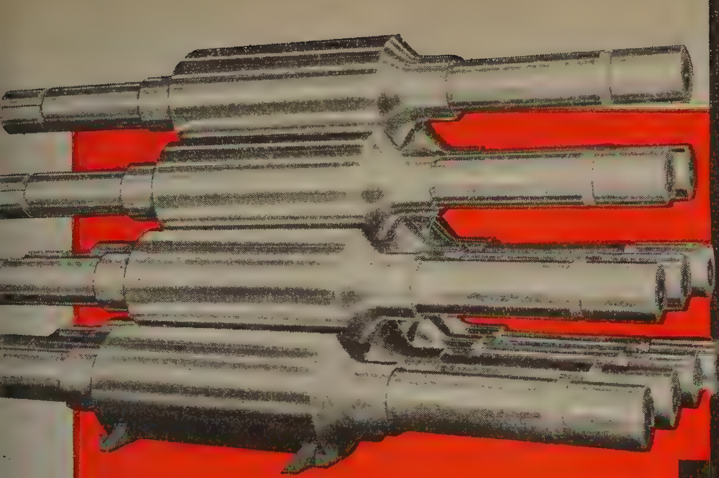
FAST, low-cost marking on light and medium heavy parts is claimed for an automatic marking machine, by *Cadillac Stamp Co.*, 2138 Riopelle St., Detroit 7. It will mark steel, iron, brass, aluminum, plastics, leather, and wood. The machine, called the Automark, is suited for light forming and piercing operations, and for assembly work consisting of pressing, staking, crimping and light riveting. A micro-electric control releases the stamping ram only when work is in position. Automark will mark flat work or a range of curved surfaces. Parts up to 8 in. can be marked. Impression depths range from 0.0005 to 0.015 in.



Liquid Wax

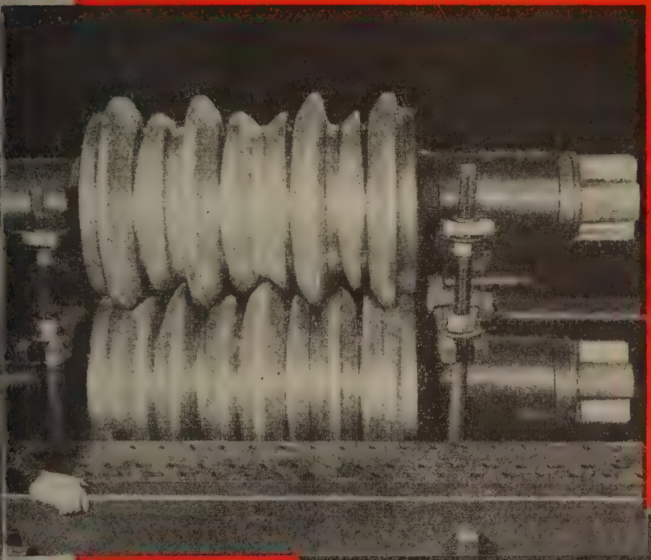
FOR use as a lubricant in the manufacture of metal impact extrusions, a liquid wax has been developed by *S. C. Johnson & Son, Inc.*, Racine, Wis. In impact extrusion a waxed metal slug is placed in a die and struck a single, hard blow with a punch, causing the metal to flow out of the die and shoot up the sides of the punch to form a perfect tube. This LW No. 20 wax is said to give an even coat, remains in place under the terrific heat and does not dissipate itself. It is applied to slugs before extrusion by dipping or tumbling. It provides a dry finish that is easy to handle, and will not turn rancid.

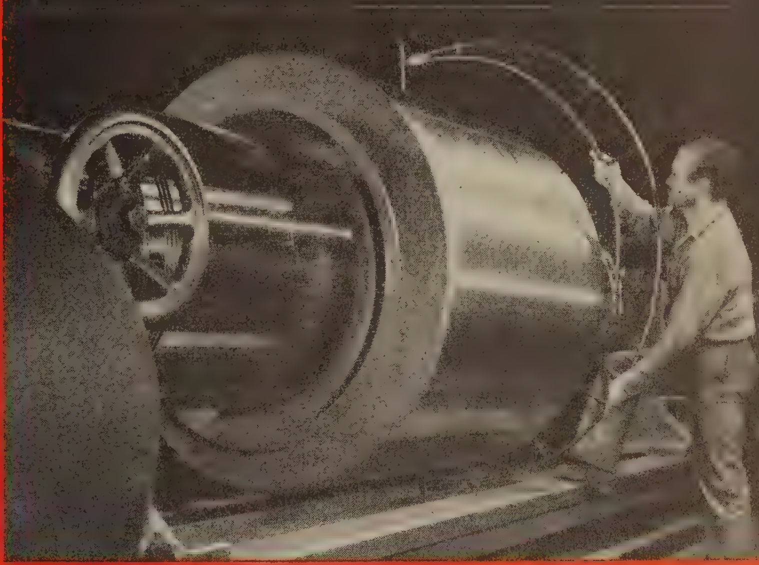
Rolls and Pinions
Designed and Built by
MESTA



Group of Forged Hardened Electric Steel Working Rolls for Cold Reduction Mills

A pair of Mesta Merchant Mill Rolls for the production of I-Beams

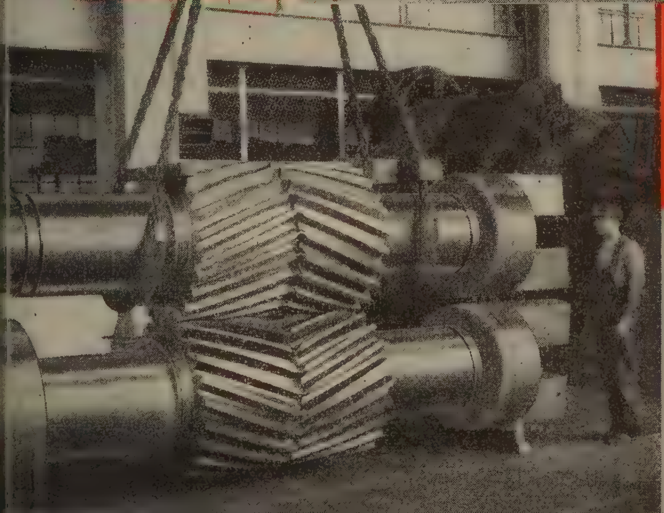




Mesta 56" diameter Special Alloy Cast Steel Backing-Up Roll for a modern high speed Four-High Cold Reduction Mill

Mesta 60" Heavy Duty Traveling Wheel Head Type Roll Grinder

38" x 54" Forged Steel Blooming Mill Pinions
Mesta also produces Cast Steel Mill Pinions with cut or molded teeth



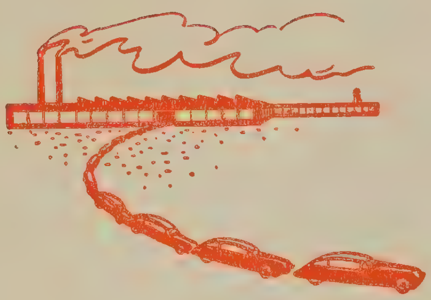
Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY
PITTSBURGH, PA.

Assembly Line . . .

WALTER G. PATTON

• GM boost in car prices makes it unanimous . . . Steel buyers badly confused as the multiple basing point system is abandoned . . . Chrysler tooling for postwar models to cost $75 million.



DETROIT—Announcement of an 8 pct boost in passenger car prices here by GM effective July 26 just about makes it unanimous — except for Crosley. General Motors is the only major car maker who had not raised prices in recent months.

The auto price spiral makes depressing reading for the prospective new car buyer who not only sees no improvement in his chances of getting a new car, but also sees the price soaring skyward—maybe well beyond the range of his pocketbook.

In justice to General Motors it can be pointed out that from a competitive standpoint GM prices were generally somewhat below its competitors. This was the first GM price boost since August, 1947, and the fourth since production was resumed following the war.

With the removal of OPA, GM raised its prices $100 in Nov., 1947. In Jan., 1947, upward price revisions were announced by Chevrolet and Pontiac. In Aug., 1947, a general price change of 2 to 6 pct was made.

Previous to the recent price advance it was claimed that some Chevrolet models were selling at nearly $300 below its competitors. In the prewar period a $25 differential in the low price field was substantial.

The spiraling cost of materials, including the recent $9.34 boost in steel prices plus the almost certain prospect of a further three cent wage raise under its escalator labor contract in September, were undoubtedly the most important factors prompting the GM price decision.

Most sources here have placed the estimated increase in automotive steel costs at $25 to $30 per car. Past experience has shown, however, that the increase in prices for finished products turned out by the automobile industry and by its parts and materials suppliers always outstrip by a wide margin any upward revision in the cost of raw steel.

The present increase in the lowest cost Chevrolet model is approximately $80. Although most GM divisions have not yet announced any changes officially the price boost can be figured roughly as follows:

Assumed Factory Sales Price	Approximate Increase in Price
$1200	$ 96
1500	120
2000	160
2500	200
3000	240

No changes in GM truck prices are being made at this time.

The GM price jump compares with an 8.7 pct boost in 1949 models announced in June by Ford and a recent advance of $75 to $131 in passenger cars produced by Chrysler Corp. Recently, Kaiser Frazer announced an average raise of 4.7 pct. Earlier Hudson, Nash, Packard and Studebaker had increased the price of their products.

While UAW-CIO sources have been vehemently maintaining that the recent boost in wage rates can be absorbed without raising car prices, it now seems as inevitable as night following day that any substantial change in labor rates here will inevitably be followed by a boost in car prices.

To many Detroit observers the recent twist in the tail of auto prices is bound to have at least as strong an inflationary effect as any of its predecessors, regardless of what the industry's critics may think of the justification for an increase in car prices.

It should be pointed out that the recent GM price advance does not reflect any increase in the cost of tooling for its new postwar models yet to be introduced. If, as is now freely predicted here, GM goes forward with its plans for a whopping new car introduction at the Waldorf in January, 1949, it may be expected that even with a stabilized wage-price index, the price tags on the newest models are going to be substantially above the present level. Up to the present time, each new model introduction has been accompanied by an upward price change.

* * *

AT the moment most auto companies have borrowed all the clerical help they can get to compute steel prices on the new mill basis. The scope of the present activity can hardly have been contemplated by the Washington authorities who recently gave the heave-ho to the multiple basing point system.

Armed with a freight-rate book, auto steel buyers now have the unenviable task of computing the cost, for example, of each steel product from each mill to each of its parts producing units. The permutations and combinations are obviously almost endless. The central purchasing bureau of one auto firm, for example, will have to refigure its steel costs for all the products it buys for more than 50 manufacturing units. This is only the beginning of the problem since comparative price setups must then be made indicating the most economical source.

Some steel buyers here have estimated roughly that the average boost in steel prices due to abandoning of the basing point system

WHEELABRATE sanitary ware

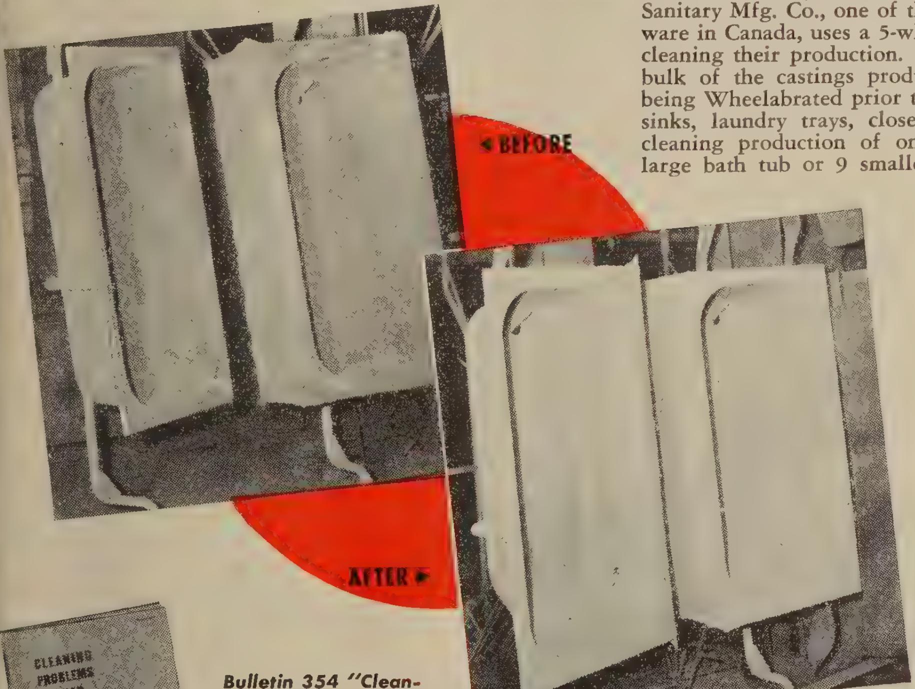
for *low cost* cleaning - - and the *right finish* to anchor enamel in a permanent bond

For sanitary ware to look and serve its best, the finish must be of perfect quality. The slightest imperfection detracts from the band-box appearance that is so essential to lasting beauty. The critical factor is a well-prepared, perfectly clean surface that will anchor the enamel in a permanent bond.

To insure perfection in this important phase of production a good many of the important sanitary ware plants have standardized on Airless Wheelabrating . . . the fast, low-cost cleaning process used by more than 5,000 plants throughout the world. The typical case histories shown below will illustrate the type of performance to expect when YOU change to Wheelabrating.

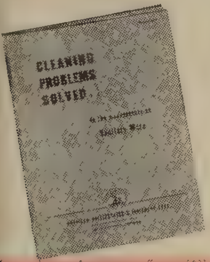
UPHOLDING THE SLOGAN "DURABLE AS THE PYRAMIDS"

When your trademark reads, "Durable as the Pyramids" you've got to be sure your processing is right. That is why Port Hope Sanitary Mfg. Co., one of the largest producers of cast iron enamelware in Canada, uses a 5-wheel Wheelabrator Monorail Cabinet for cleaning their production. Although large bath tubs constitute the bulk of the castings produced at this plant, other sanitary ware being Wheelabrated prior to enameling, includes lavatories, kitchen sinks, laundry trays, closet tanks, drain boards, urinals, etc. A cleaning production of one hook a minute, containing either a large bath tub or 9 smaller pieces, is maintained in all types of work. The Wheelabrator is also used for de-enameling. Prior to the installation of the Wheelabrator, a number of Airblast Rooms were utilized.



120 BATHTUBS CLEANED HOURLY

A Wheelabrator Monorail Cabinet used by a leading manufacturer of sanitary ware (name on request) cleans 120 bath tubs hourly prior to enameling. The machine is also designed for handling small ware such as sinks and wash bowls. A higher cleaning production is obtained on the smaller pieces since 8 sinks or 6 wash bowls can be hung on each of the conveyor hooks of the monorail.



Bulletin 354 "Cleaning Problems Solved in the manufacture of Sanitary Ware" will be sent to you upon request. Write for your copy today.

THE AMERICAN MOLDER

American

WHEELABRATOR & EQUIPMENT CORP.
(FORMERLY AMERICAN FOUNDRY EQUIPMENT CO.)
510 S. Byrkit St., Mishawaka 3, Indiana

WORLD'S LARGEST BUILDERS OF AIRLESS BLAST EQUIPMENT

will average close to $3.00 per ton. This is exclusive of any change in the mill prices, of course.

District managers for the steel companies likewise have extensive computations to make. After computing the price of each product from each mill into Detroit, it will be necessary to make similar computations for cities like Grand Rapids, Kalamazoo, Lansing and other Michigan industrial centers. Prices have to be figured not only for their own products but for those of their competitors.

This is just the start of the price problem so far as steel distributors are concerned. The next step will be to make similar computations for trucking and water transportation and combinations of these. Because of the lack of uniformity of trucking rates, such computations are likely to become somewhat involved.

To some steel buyers here, however, the recent price changes seem much less important than the possible reshuffling of customer lists that may come in the wake of the new price setup. Curiously enough, some major auto sources are at least as much concerned about how the "little fellow" will make out as they are about their own steel for tunes. This is not altruism, of course; local steel buyers may only be thinking about the necessity of "feeding back" steel to a number of small steel users who could be easily squeezed in the vast reorganization of steel customer lists that is taking place.

At the moment, the steel picture has reached a state of confusion hardly attained at any previous time in the auto industry's history. Several months will be required before anything resembling stability is achieved according to leading steel buyers here.

* * *

SPEAKING before a business conference at Stanford University recently, K. T. Keller, president of Chrysler Corp., disclosed that the cost of dies, tools and equipment for Chrysler Corp.'s new line of vehicles will cost $75 million. According to Mr. Keller, the outlay to bring out new models today is almost five times as much as similar programs cost before the war. In his remarks, Mr. Keller did not indicate the extent to which more elaborate tooling and higher unit prices have contributed respectively to increased costs.

Speaking on the subject, "The Automobile Industry in the Postwar World," Mr. Keller gave considerable attention to engineering and research as well as the effect of tax policies on the industry's present and future operations.

Referring to styling, the Chrysler head emphasized that "important as style may be to the buyer, the fundamental thing is the goodness of the product, goodness from the standpoint of performance, comfort, convenience and safety of operation."

Satisfaction in the product finally depends on whether or not it is pleasant to sit in the car while it is moving, Keller said.

"This means the sum total of many things: that the seat is at a comfortable angle, not too soft, not too hard, not too low; that (the driver) can see out conveniently; that the steering action is easy, and the brake action is too; that the car holds the road well so that the speed is adequate and the acceleration is good."

Recalling perhaps that some of Chrysler's competitors have been criticized for lack of headroom in their new models, Keller emphasized that "even headroom is important."

Mechanical integrity must go hand-in-hand with the factors of personal comfort, Keller said.

"Wide as our research interests range, you may be sure that more time and attention, and more money is spent year in and year out, on these quiet means of individual satisfaction than upon creating revolutionary vehicles and power plants," Keller told his audience.

Emphasizing the rising construction costs, Keller said the book value of Chrysler stockholder's equity is now $330 million; if an atomic bomb should wipe out the company's present plants, he said, the Chrysler Corp. plants could hardly be reproduced for less than $750 million.

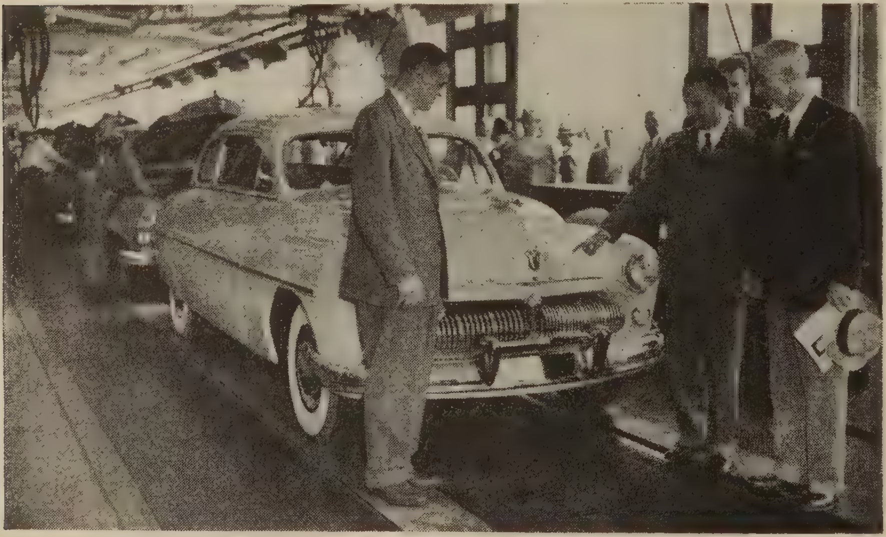
Keller told his audience that the value of the physical assets of Chrysler Corp. is carried on the books at $105 million.

Referring to the Government tax policy, Keller said that "the ruling idea in taxation always has been to pluck feathers where it would hurt least, so the bird wouldn't squawk." "That is fine," he added, "if it means that every plucked bird remains able to carry on his barnyard routines unimpaired. But the meaning now has been twisted to signify plucking half naked the particular birds that have the smallest electoral votes."

Carried far enough, he emphasized, the flock is destroyed and with it the yield of feathers.

At the present time Keller believes that government tax policies seem to be aimed at bringing about in industry a process of exhaustion of resources, especially in regard to provisions for depreciation allowances adequate in terms of current inflated costs.

SEABOARD ASSEMBLY LINE: Cars roll off the assembly line at the dedication of the new Lincoln-Mercury plant at Metuchen, N. J., as R. J. Neville, plant manager; Benson Ford, vice-president of the Ford Motor Co. and director of the Lincoln-Mrcury Div.; and Dr. Robert C. Clothier, president of Rutgers University, stand by. This is the first Lincoln-Mercury assembly plant on the eastern seaboard.



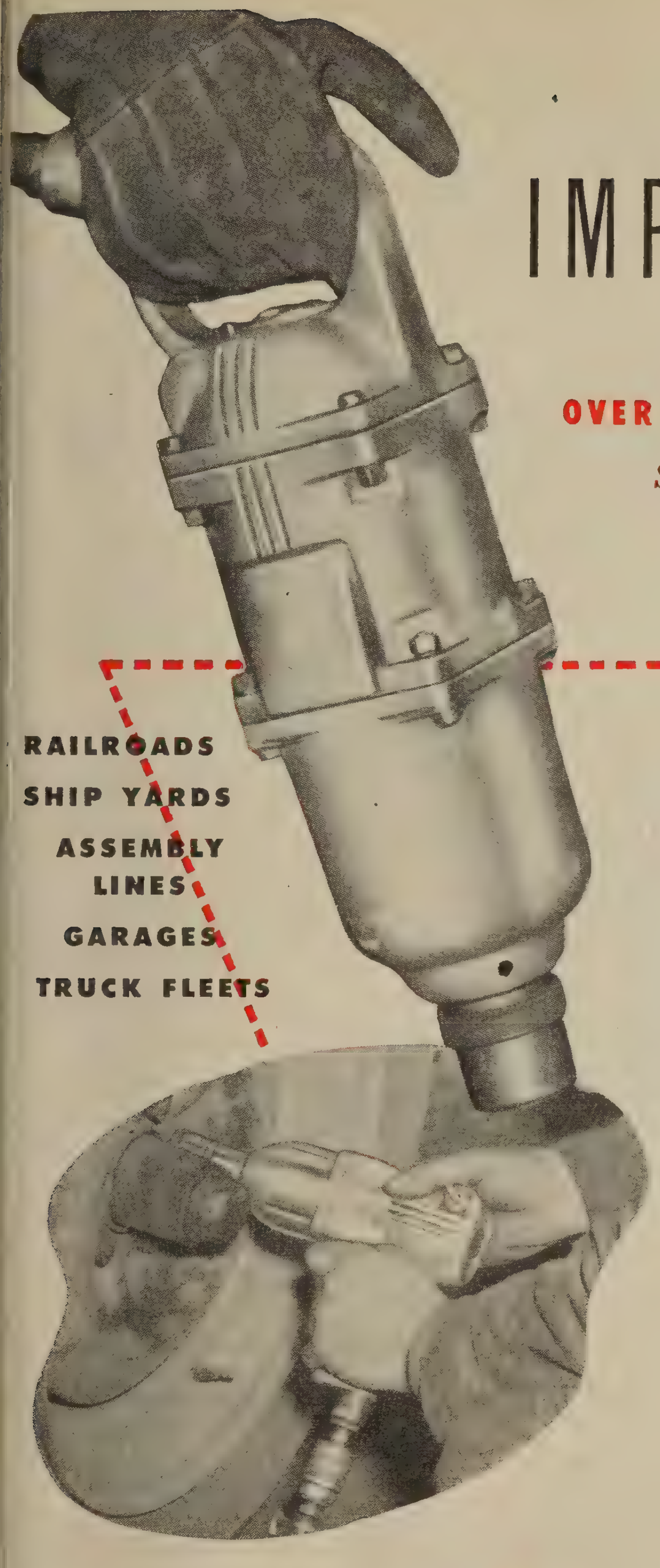
Thor

IMPACT WRENCHES

UNMATCHED for POWER—

OVER 1000 HARD BLOWS A MINUTE—

Setting SPEED and LOW COST
Records on Scores of Jobs!



METAL FABRICATING

RAILROADS
SHIP YARDS
ASSEMBLY LINES
GARAGES
TRUCK FLEETS

Three men on a wrench can tug at a frozen nut a hundred times—but it's the *one hard yank* that finally spins the nut loose. On that same principle is based the overwhelming acceptance of new Thor Air Impact Wrenches. The Thor Wrench hits HARD once on every revolution of its rotor—and with more than 1,000 of these hard impacts a minute is outperforming everything in its class . . . for *speed* in driving nuts, bolts or cap screws—for *stamina* in standing up longer under impact shock—for *proving the best money saver* on every job! Call a Thor branch today for a convincing demonstration.

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Thor PORTABLE POWER TOOLS

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Washington . . .

EUGENE J. HARDY

U. S. Steel demand estimates under fire . . . Government economist accuses steel industry of anticipating a major depression . . . Capacity of more than 100 million tons by 1950 held necessary.

WASHINGTON—That indefatigable forecaster of steel demand, Louis H. Bean, assistant to the Secretary of Agriculture, is at it again. This time, Mr. Bean takes off his gloves and wades into Bradford B. Smith, U. S. Steel Corp. economist. Several months ago the American Iron and Steel Institute published a critical analysis by Mr. Smith which dissects Mr. Bean's original study of steel demand and capacity and their relationship to full employment. (THE IRON AGE, June 5, 1947, p. 96). In this study Mr. Bean estimated steel demand by 1950 to be in excess of 100 million tons necessitating a 20 pct increase in capacity. He further accused the steel industry of maintaining a pessimistic attitude in regard to expansion.

In this third round, Mr. Bean reiterates his earlier position in even stronger terms and states that Mr. Smith's estimates of needed capacity are based on the occurrence of another major depression. Mr. Bean's latest effort resulted from an inquiry by Senator Murray, D., Mont., pro-expansion advocate, which raised a number of questions regarding the Smith study.

Starting off by emphasizing that there is nothing new in the Smith study, Mr. Bean maintains that by 1950 this country will need something over 100 million tons of steel based on the experience of past prosperity years, as compared with Mr. Smith's estimates of normal steel demand for "continuous full employment" of 59 to 71 million tons.

The Smith estimates of 59 to 71 million tons are characterized as "even worse" than those of Wilford Sykes, president of Inland Steel, which run from 76 to 80 million tons.

(The three estimates are compared on the accompanying chart prepared by Mr. Bean.)

Mr. Bean bases his 100 million ton estimate on "the fact that there has been a rising trend in per capita production in prosperity years and that even if we allow for a major and minor depression like those in the 1920's we would need more steel capacity than the industry is providing for 1950."

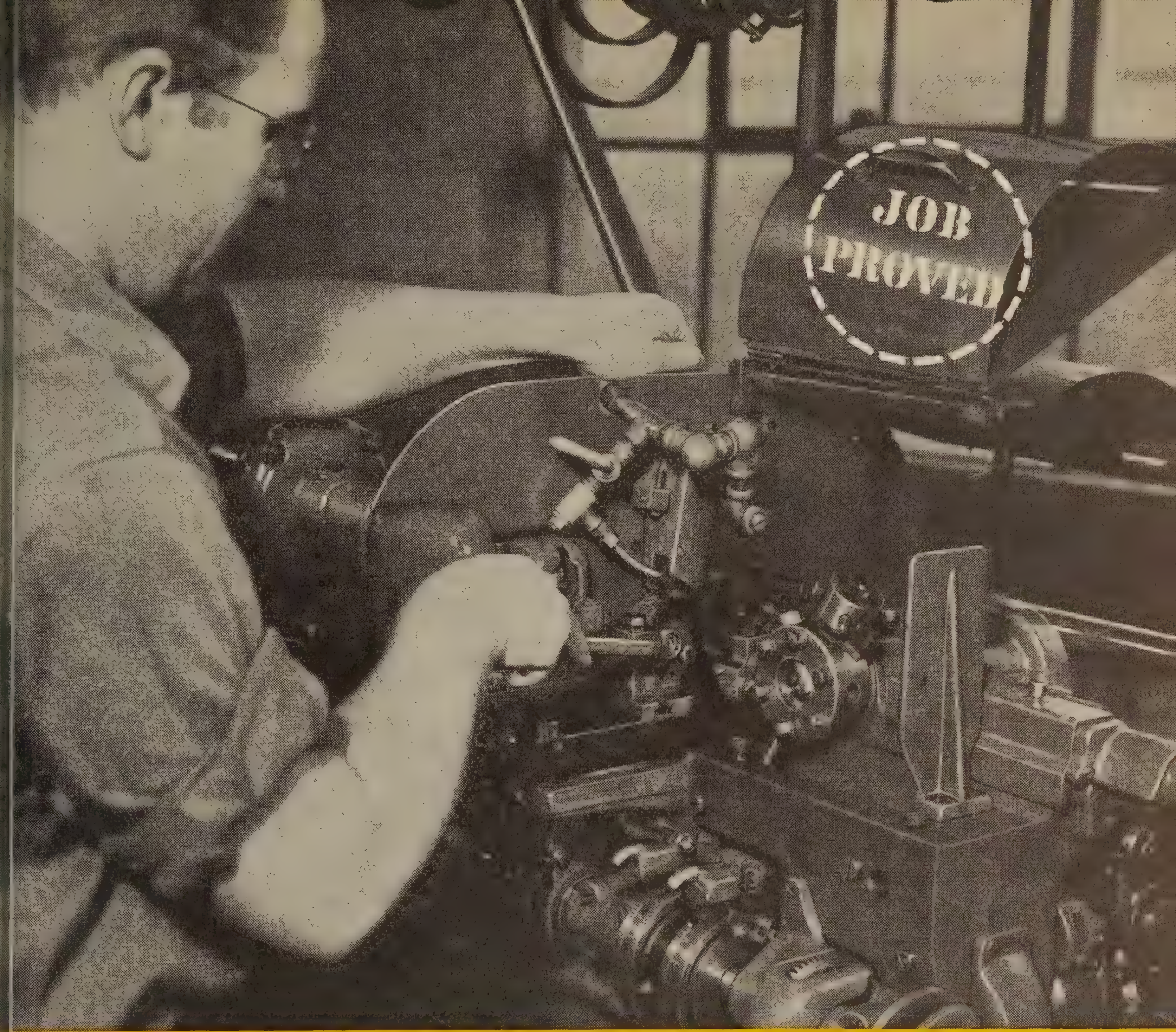
Mr. Syke's estimates, according to Mr. Bean, are based on "his erroneous judgment that per capita production has not been rising, that the per capita demand for steel is constant, and that the 1929 per capita demand is as much as we should expect since that was a prosperity year of high steel consumption."

MR. BEAN further states that "Mr. Smith's estimates of normal demand of 59 to 71 million tons are based on his preference for a peculiar 'S' shaped trend instead of a straight line trend, to convey his belief that the steel industry has now matured to the point where the total demand for its products has about stopped growing; on the high level of production for 1943-45 that he considers due to the great wartime demand for steel; and on his judgment that normal demand must therefore be far below that wartime peak. He does not take into account the vast amount of steel that was diverted from normal civilian to military demand. His "normal" figures are an average of steel production in the prosperity of the 1920's and the depression of the 1930's.

"His definition of 'normal continuous peacetime full employment demand for steel' is, on the basis of past experience, just enough steel to permit the employment of 85 pct of the labor force, with 15 pct unemployed. Since he thinks 59 to 71 million tons will give continuous peacetime full employment he must have in mind that we can have full employment with too little steel, as at present, offset by subnormal manufacturing output per manhour and rising prices, or that in time, substitutes for steel will expand sufficiently to offset the declining importance of steel implied in his estimates, or that relatively more jobs in the future will be found in nondurable consumer goods and service industries than at present."

In attempting to reconcile Mr. Smith's demand estimate of 59 to 71 million tons with the steel industry's claim to expansion from an output above 85 million tons, Mr. Bean suggests that the U. S. Steel economist "holds the view strongly that the steel industry has attained maturity and that our monetary mechanism under the Federal Reserve System is going to produce another deep and prolonged depression like that of the 1930's. These considerations color his statistical judgment and lead him to define normal steel demand below what is ordinarily required when we have full employment. His definition reminds one of the way the giraffe got its name. According to Mark Twain, it was called a giraffe because it looked like one. 'Normal' isn't normal because Mr. Smith calls it that."

IN response to another of Senator Murray's questions, Mr. Bean states that "he has no way of judging whether the industry believes the statistical estimates



TOOL LIFE TRIPLED

Sunicut with Petrofac* Improves Finishes and Lengthens Tool Life in Intricate Machining Job

In the machining of small parts for radios, a shop was using a dark cutting oil with poor results. Finishes were rough, tool life was unsatisfactory. The dark oil made the work hard to see.

Changing to Sunicut with Petrofac, the plant found the ideal oil for its purpose. Its cooling and lubricating qualities are producing excellent finishes, and increasing tool life from 10 hours to 30 hours. Further, machinists can see the work better through this transparent oil.

Job: Turning, forming, threading, pointing
Machine: Brown & Sharpe OOG Automatic
Part: Stud pulley for radio
Material: B 1112 steel
Tools: Rex AA high-speed circular form tools
Spindle Speed: 2,600 R.P.M.
Cutting Speed: 165 S.F.P.M.

These new grades of Sunicut with Petrofac are making possible better finishes than ever, and faster work in a wide range of operations. The new Sunicut grades with Petrofac possess superior metal-wetting, anti-weld, and extreme-pressure qualities. They are not blended with animal or vegetable fatty oils—cannot turn rancid. For additional information about the various Sunicut cutting oils, write for folder IA-8.

SUN OIL COMPANY • *Philadelphia 3, Pa.*
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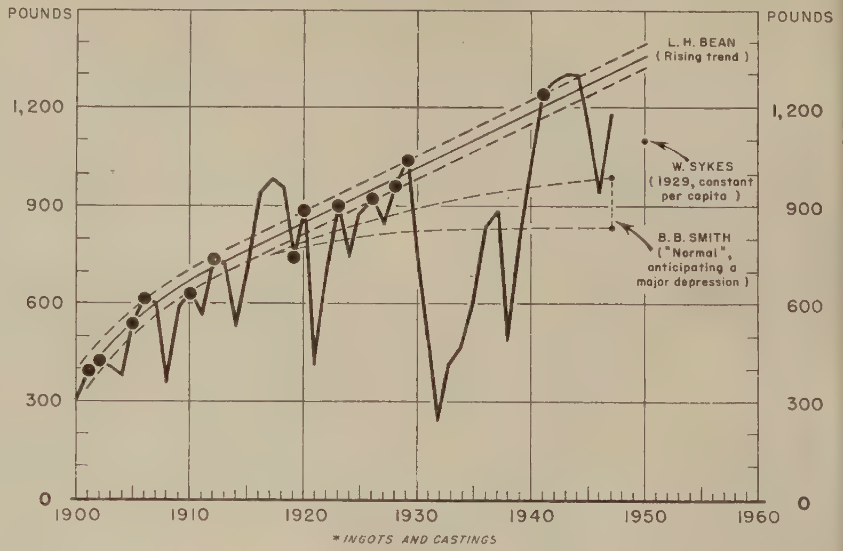
SUN PETROLEUM PRODUCTS
"JOB PROVED" IN EVERY INDUSTRY

SUNOCO

made by Mr. Smith or whether 'this is some game the Institute's statisticians are playing in spite of contrary views held by the industry.' Members of the industry have presented testimony that individually they are expanding but that the industry as a whole is faced with a demand much below the present and with the prospect of a deep and prolonged depression. It is probably not unfair to say that the Institute's and the industry statisticians appear to be feeding unwarranted pessimism to their superiors that does not square with the better judgment of the practical-minded leaders in the industry who are spending consumer's money in advertising their plans for expansion."

The letter to Senator Murray, according to Mr. Bean, gives only brief and general answers to the Senator's questions. He plans to submit at a later date an extended statement including analyses that he has developed as a result of the Senator's inquiry. He hopes that this detailed data will show conclusively how "erroneous are the Smith assumptions that demand for steel has practically stopped expanding, and what this pessimistic view could mean to agriculture and the economy as a whole if it were allowed to check the required expansion of the industry."


THREE ESTIMATES OF STEEL* PRODUCTION PER CAPITA REQUIRED FOR FULL EMPLOYMENT, UNITED STATES

*INGOTS AND CASTINGS

Lustron Houses Soon On Mass Production Basis

Minneapolis

• • • **The assembly-line** production of homes will get under way shortly according to Carl G. Stranlund, president of Lustron Corp., fabricators of porcelain enameled steel houses.

The first $500,000 worth of enameling and finishing equipment has been installed by the Dispatch Oven Co., Minneapolis. Equipment ranges from low temperature cover and ground coat driers and frit spray booths to a complete finishing system that includes 5-stage metal preparation, spray booths and finish baking ovens.

Lustron homes will sell for about $7500 within a 50 mile radius of Columbus, O. An elaborate distribution plan has been set up in which registered contractors in different localities who act as agents for Lustron build foundations and erect the bungalow type homes.

•

Cleveland

• • • **Tom L. Smith, Jr.,** president Pressed Metal Institute, recently called on the pressed metal industry to fight the proposed allocation of steel to five prefabricated house builders. In a bulletin to the industry, Mr. Smith cited testimony against the allocation by J. C. Rodman, president of Alliance Ware, Inc.

In his testimony Mr. Rodman declared that "an all steel prefabricated house uses between 9½ and 10 tons of steel, as compared to 1½ tons of steel in the ordinary house." "The 59,000 tons will build approximately 6000 all steel prefabricated houses; the same amount of steel will build 39,000 ordinary houses.

THE BULL OF THE WOODS BY J. R. WILLIAMS

THAT'S A BAD PHYSICAL SITUATION HE'S IN, BUT A WORSE DIPLOMATIC ONE! IF HE BAWLS TH' GUY OUT FOR WASTIN' OIL, TH' SWEEPER'S NEGLECT SAVED HIM FROM GOIN' ALL DOWN!
TH' NON-SKID CHIPS GAVE HIM A GRIP, ALL RIGHT, BUT IN SUCH A CASE HE'D BETTER JUST STRAIGHTEN UP AN' GO ON!
NOTICE
J.R.WILLIAMS
8-6
THE DEADLOCK
T. M. REG. U. S. PAT. OFF.
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An Exciting New Event

AT THE

1948 NATIONAL AIR RACES

CLEVELAND, SEPTEMBER 4, 5, 6

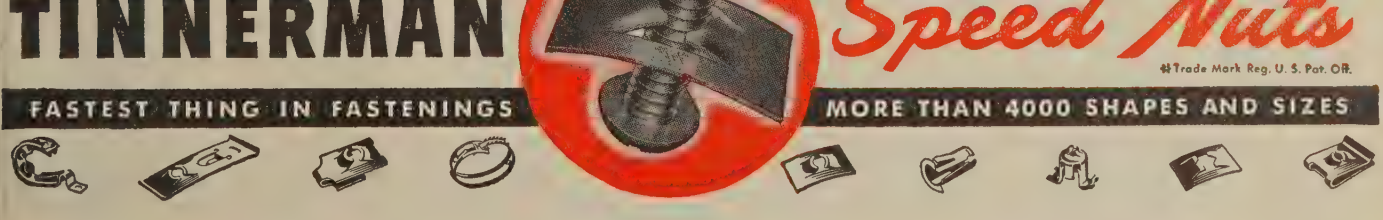
TINNERMAN *International* TROPHY RACE

The National Air Races go *International!* In keeping with the world-wide spirit of these times, a new feature event of this year's air race program will be the Tinnerman International Trophy Race.

Pilots and planes of all nations will answer the starter's flag on Saturday, September 4. As they roar around 7 laps of the 15-mile course, every part on every plane will be undergoing the severe test of all-out performance. From tests like this, aircraft manufacturers have developed modern miracles of air transportation.

The Tinnerman Trophy Race is a tribute to these manufacturers . . . a tribute paid by the producer of SPEED NUTS*, SPEED CLIPS* and SPEED CLAMPS*. These Tinnerman Fasteners, on military and commercial planes, are playing a major role in aviation's great advancement. TINNERMAN PRODUCTS, INC., 2038 Fulton Road, Cleveland 13, Ohio.

In Canada: Dominion Fasteners Limited, Hamilton • *In England:* Simmonds Aerocessories, Ltd., Treforest • *In France:* Aerocessoires Simmonds, S. A., Paris.



TINNERMAN *Speed Nuts*

*Trade Mark Reg. U. S. Pat. Off.

FASTEST THING IN FASTENINGS

MORE THAN 4000 SHAPES AND SIZES

West Coast

ROBERT T. REINHARDT

• First results of rapid calculations on f. o. b. and new price raises convince western steel users that they are further behind the eight-ball than their eastern competitors.

SAN FRANCISCO—As western steel buyers crawled out from beneath miles of calculator tape and surveyed their offices littered with piles of scratch paper and broken pencils, most of them have come to the conclusion that the recent price increases, when added to the mark-up necessitated by the change to the f.o.b. price system, leave them firmly established behind the well known eight-ball.

Some few steel users fortuitously located close to their traditional source of supply temporarily enjoyed the advantage of the f.o.b. price basis. However, with announcements by all West Coast producers of price increases ranging up to 12 pct, that era of good feeling was short lived.

Fabricators at Seattle, Portland, San Francisco and Los Angeles are generally extremely unhappy about the present price situation. Even those located within relatively short distances of mills found but little satisfaction in that fact because of the limited range of materials available from local sources. Once again the limited rolling facilities of the West are brought into sharp focus, but very few men in the steel business here see any immediate prospect of increasing the range of products to be produced on the West Coast over and above those now here and through facilities in process of construction.

Consensus seems to be that once more the isolation of the West is going to work a serious handicap on expansion and development of the metal working industry and the only immediate ray of hope seems to come from the prospect of congressional action which may possibly restore the basing point system in some form. Unquestionably wide differences of opinion will prevail for some time as to the relative merits of the old and new system of pricing and the overall effect will not be determined until comparative figures are developed by the major steel users of the West.

Economists interested in the long range and broad view of the industrial development of the West and its prosperity are still uncertain of the total effect on the price increase when taken into consideration with the added payrolls to be derived from the 13¢ an hour industry-wide wage increase.

Superficially it appears that here again the West which imports the greatest part of its steel from the East will be contributing a greater share of the wage increase to eastern producers than will be realized by local labor. It is apparent that a total increase in payrolls of the relatively few steel workers in the West which, of course, will go into the channels of trade here, will be relatively small in comparison to the total extra wage burden carried by all steel.

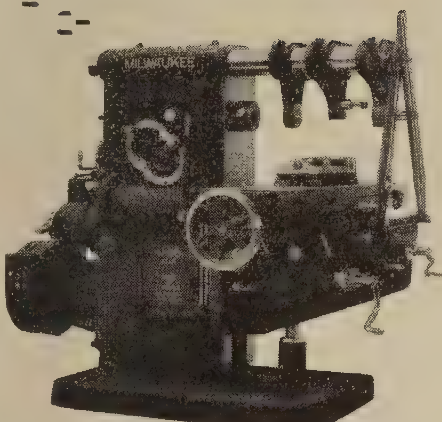
As yet there is no evidence of steel users contemplating moving their plants closer to sources of supply and the feeling is prevalent that such actions would be delayed indefinitely, or at least until all hope is abandoned that legislation permit the restoration of the basic point system.

There has been some juggling of operations by fabricators having plants at various points on the Coast so as to take whatever advantage does exist of proximity to sources of supply. However, even this resource is not generally followed because of the difficulty in selecting any one mill as being an adequate source of supply for all needed forms and types of steel. At best, fabricators and other steel users are attempting to be as agile as a ballet dancer in shifting and rescheduling their work.

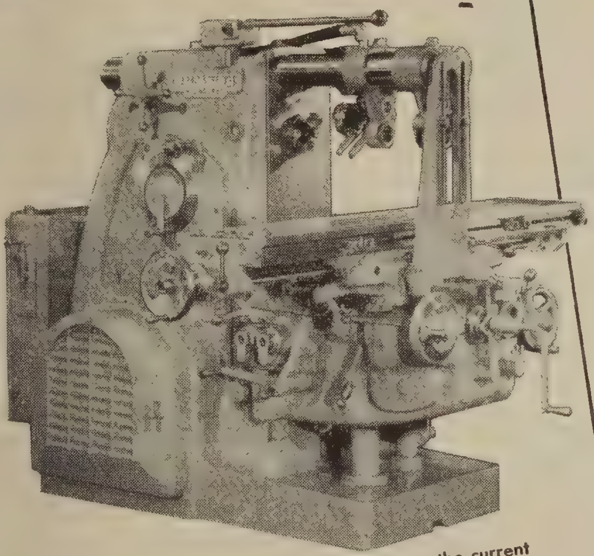
One local fabricator points out that even though his Los Angeles plant can get steel more cheaply from Fontana than elsewhere he is not convinced that the southern plant is the one in which his product should be manufactured because his principal market is in central and northern California. While his calculations were not completed, it was his thought that the added cost of shipping the semi-finished steel from Fontana to San Francisco would still not equal the cost of shipping the steel from Fontana to Los Angeles, fabricating it there and paying a higher rate for the finished product to this city.

LOCAL warehousemen have arrived at tentative prices for steel based largely on averages of the principal suppliers and some of them are frank to admit that these averages are on a speculative basis subject to upset if any of their suppliers curtail shipments and makes it necessary to buy from more remote mills. These jobbers have followed the producers in adopting an f.o.b. warehouse price and are definitely restricting free delivery to the metropolitan areas they serve. It is believed this practice will be generally followed throughout the West.

While steel users were grousing about the increases they must pay for their raw materials and probably pass on to their consumers, western producers were likewise feeling the effects of $2.50 per ton increase for No. 1 heavy scrap in addition to their other increased costs. Scrap buyers are frank to admit that this raise was made necessary because of the potential inroads of buyers from the East who were making tempting offers



1920—This Kearney and Trecker Milling Machine was one of the first to use Twin Disc Clutches.



1948—Advanced in design, the current Kearney and Trecker Milling Machine still uses Twin Disc Clutches.

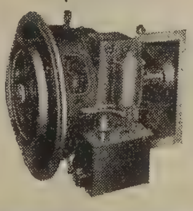
1920-1948 Twin Disc *Equipped*

Kearney and Trecker Corporation, Milwaukee, Wisconsin, used Twin Disc Clutches on its machine tools as early as 1920. Kearney and Trecker still uses Twin Disc Clutches in 1948.

During the past 30 years, leading manufacturers of equipment for construction, logging, marine, petroleum, locomotive, farm implement, engine, and machine tool industries have found Twin Disc Clutches and Hydraulic Drives efficient units for power transmission.

Twin Disc Clutch Company, Racine, Wisconsin, (Hydraulic Division, Rockford, Illinois.)

Hydraulic Torque Converter



Heavy Duty Clutch

Machine Tool Clutch

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CLUTCHES AND HYDRAULIC DRIVES
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Tractor Clutch

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JUDGE TWIN DISC BY THE COMPANIES IT KEEPS

to local dealers. No. 3 bales went up abruptly from $19.50 per gross ton to $24.50 per gross ton as buyers sought to encourage dealers to more carefully segregate galvanized materials which has been creeping into No. 2 bales. This practice has not been uncommon when the spread between No. 2 and No. 3 has been too great. Remote scrap in Arizona, Nevada and Utah is bringing in $24.50 per gross ton at shipping point.

Little hope has been expressed that either the change to the f.o.b. price system for steel or the increase in prices will ease the local supply situation to any extent. Some hope had been expressed that when shipments of steel pipe were suspended because of the Department of Commerce's action in holding up shipments for the trans-Arabian pipe line that more plate would get into circulation here, but the steel pipe originally designated for this work is now being diverted, temporarily at least, to the Tennessee Gas Transmission Co. for use in building facilities for delivering increased quantities of gas to the eastern part of the country.

Consolidated Western Steel Corp. at Maywood, Calif., is continuing production on this material and the Tapline export license application is to be considered again in September. According to W. S. Rodgers, board chairman, and B. E. Hull, president of the trans-Arabian Pipeline Co., the oil line will be completed as rapidly as the steel becomes available for the work. Seventy miles of line have been laid and the company reportedly has enough steel pipe for another 168 miles.

In discussing the use of this material for pipe the company officials point out that much less steel will be required to complete this line than would be necessary to construct tankers to carry an equal amount of oil and that less time will be needed to complete the line than to construct tankers of equal capacity. It is contended that both time and steel will be ultimately saved by the use of this scarce material for the pipeline.

Already 53,587 tons of pipe have been shipped to Saudi, Arabia, which is enough to construct 238 miles of line. To complete the route, 253,913 additional tons of steel will be required for the remaining 832 miles of pipe.

MR. HULL stated "Transportation of 300,000 barrels per day from the Persian Gulf to the Mediterranean would require 62 T-2 type tankers. To build that number of tankers would require 322,000 tons of steel. We need only about 208,000 tons of pipe to complete this line. If that steel were put into new tanker construction it would result in the building of only 40 tankers. In other words, the same amount of steel in tankers would provide only about 200,000 barrels throughout per day, as compared with the 300,000 barrels that the pipeline will deliver."

Conversion work at the Geneva Steel Co. plant at Geneva, Utah, is proceeding according to schedule with more than one-third of the project completed and indications are that coils of hot strip steel will be turned out there early in 1949.

There are now four stands of rolls in the continuous finishing group of the plate mill now capable of rolling steel slabs into plate from 1½-in. to 3/16-in. thick, and two additional roll stands are to be added which will permit the mill to roll strip down to 1/20-in. thick. The American Bridge Co. is at present erecting a large two-bay building to be used for handling and shipping the hot rolled coils which are to be cold finished at the new Pittsburg, Calif., and Torrance, Calif., plants of Columbia.

* * *

SALT LAKE CITY — Present prospects are that the nonferrous metals industry of the Utah-Nevada district will get through its labor relations crisis (arising from the termination of a contract period and a union revolt) without serious strikes or work stoppages.

Only menacing strike cloud on the horizon now is hovering over Kennecott Copper Corp. operations. The Magna-Arthur millmen have voted, by a close margin, to retain its affiliation with the International Union of Mine, Mill & Smelter Workers. Open pit miners at Bingham are likewise still affiliated with the Mine-Mill union, with which the capacity has refused to bargain because of refusal of officers to sign the non-communist affidavit.

But neither of these unions are in a good position for waging a strike. The millmen are split close to the middle on the affiliation issue. And many of the open pit miners are not dues paying union members.

Of the 26 unions in the district, 10 have pulled out of Mine-Mill and affiliated with the Progressive Metalworkers council. All of these have signed new contracts or are in process of doing so. Seven have disaffiliated from Mine-Mill and are working together. They are expected to sign new contracts soon.

Two have left Mine-Mill and are functioning as independents. Seven are sticking with Mine-Mill and have not signed new contracts.

* * *

Chicago Bridge & Iron Co. has established a sales office in Salt Lake City to work in conjunction with its new fabricating plant here. Manager of new office is J. Graham Daniels, who was transferred from the Chicago sales office.

The company will start work soon on a 300,000 gal. water tower for South Salt Lake.

Fontana Furnace Finally Down After 99,000 Casts

Los Angeles

• • • **"Bess,"** the **1200-ton** blast furnace which on July 13th disgorged her 2 millionth ton of iron on her 99,000th cast for Kaiser Co., Inc. at Fontana, Calif., finally broke down under the heavy burden and high blast under which she has labored for 5½ years.

A hot spot developed around the tap hole of the furnace July 25. Superficial inspection showed that the hearth cooling plates were burning through. Burdens were eliminated and the furnace has been cleared for cooling to permit thorough inspection. According to vice president F. M. Rich, indications are that only a hearth patch may be required. This would take only 3 to 6 weeks to put in. However, if a complete reline job proves necessary on close inspection, the furnace will be down 60 to 90 days.

Best estimates of competent observers indicate that the stockpile of scrap and cast pig iron will enable the six openhearths to limp along at near capacity for just about that long. Unofficially, it is reported that the scrap inventory is the best in the company's history, due largely to the company's participation in shipbreaking at Richmond, Calif. and astute purchasing on the open market.

At best this burn-through will cost the company 72,000 tons of iron.

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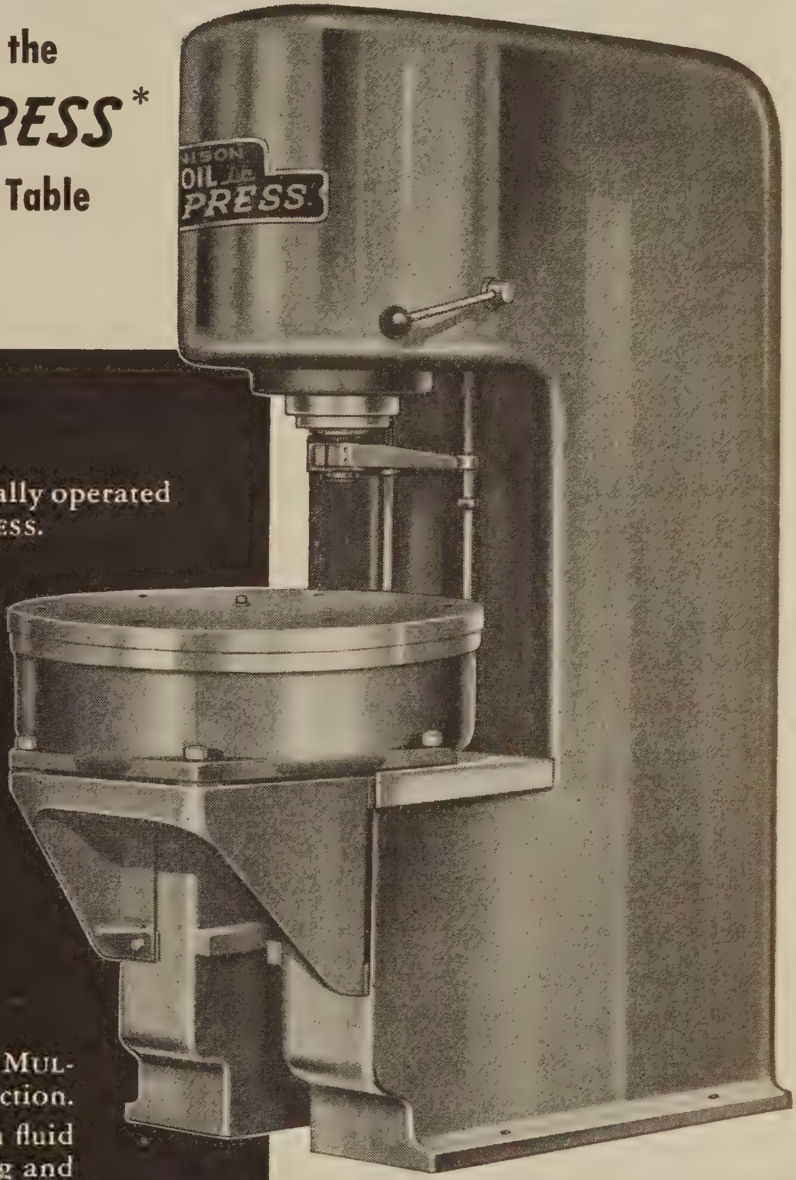

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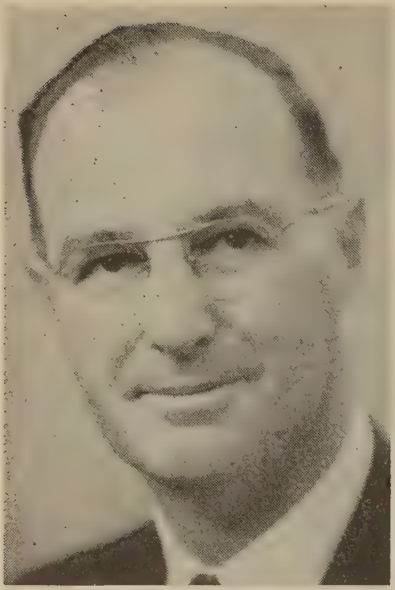

PAUL H. STARTZMAN, general manager in charge of operations, Oliver Iron & Steel Corp.

• **Paul H. Startzman** has been appointed general manager in charge of operations, Oliver Iron & Steel Corp., Pittsburgh. Mr. Starzman has resigned his partnership in the engineering firm of Drake, Startzman, Sheahan, Barclay, Inc., to assume his new duties.

• **Benjamin F. McClancy** has been named general manager, Associated Industries, Cleveland. Mr. McClancy was formerly director of the human relations division, ATF Inc., Elizabeth, N. J.

• **Richard R. Williams** has been appointed direct sales representative in the Toledo territory for the Rapids-Standard Co. Inc., Grand Rapids. Mr. Williams will have his headquarters in Toledo.

• **J. E. Hines,** sales manager, C. I. Hayes, Inc., Providence, has retired after 26 years in that post. He has been closely identified with the electric furnace industry for many years, having previously been connected with Hoskins Mfg. Co. Mr. Hines will continue in an advisory capacity.

• **George Miller,** formerly in charge of tractor and truck seat sales for the Monroe Auto Equipment Co., Monroe, Mich., has been appointed general sales manager of the Newgren Co., Toledo. Mr. Miller was associated for many years in a sales executive capacity with the Chrysler Div., of the Crysler Corp. and as sales manager of the Super Six Mfg. Co., Minneapolis.

• **Richard D. Gleason** has been appointed manager of employee and community relations by the General Electric X-Ray Corp., Milwaukee, succeeding **F. E. Scheven,** who has been appointed to the staff of the executive vice-president. Mr. Gleason comes to G.E. X-Ray from another G.E. affiliate, Locke Inc., Baltimore, where he was vice-president in charge of employee and community relations.

• **Morris R. Stanley** has been made assistant director of sales, Victor Chemical Works, Chicago. Mr. Stanley joined the firm in 1923 and for the past four years has been manager of the planning department.

• **Rolland I. Peters** has been named technical director, Ditzler Color Div., Pittsburgh Plate Glass Co., Pittsburgh, succeeding **M. G. Bell,** who will enter business for himself as a Ditzler jobber in Seattle. **Harold W. Redshaw** has been appointed assistant technical director succeeding Mr. Peters.

• **John H. Roehm** has been appointed sales manager of Bowen Products Corp., Encorse, Mich. Mr. Roehm was formerly associated with the Detroit division of General Electric Supply Corp.

• **H. B. Daniels** has been made supervisor of districts of the Lincoln-Mercury division of Ford Motor Co., Dearborn, Mich. Mr. Daniels will supervise the work of the 12 Lincoln-Mercury district managers in the nation.

• **Lloyd Arnold** has retired as salary administration supervisor, American Steel & Wire Co., Cleveland, after nearly 48 years of service. **Edward C. Barnhart,** senior salary analyst of the company, has been named to succeed Mr. Arnold.

• **R. G. Forsberg** has been named president of the recently incorporated firm, Industrial Corrosion Control, Inc., Pittsburgh. **James D. Clokey, Jr.,** has been named sales manager.

WILLIAM H. NOBLE, assistant sales manager, Republic Steel Corp.

• **William H. Noble** has been appointed assistant district sales manager, San Francisco district, Republic Steel Corp. Mr. Noble has been associated with Republic since 1939.

• **J. J. Collins** has been named assistant general manager, Iron & Steel Products, Inc., Chicago. Mr. Collins was formerly connected with the Erie R.R. Co.

• **Fred C. Foy** has been appointed vice-president and sales manager, Central Staff, Koppers Co. Inc., Pittsburgh, succeeding **E. J. McGehee,** who has been transferred to the company's wood preserving department. Mr. Foy was formerly vice-president, J. Walter Thompson Co.

• **Robert W. Eiler** has been elected a director of the National Supply Co., Pittsburgh, succeeding Charles R. Barton, who has retired. Mr. Eiler became general attorney for National Supply in 1937 and two years later was elected secretary of the company.

• **Don G. Savage,** general sales manager of the Thew Shovel Co., has been elected vice-president of the Lorain, Ohio, power shovel and crane manufacturing firm. Mr. Savage, who started his career with Thew as a clerk, was southeastern sales manager prior to his appointment as general sales manager. He will continue in charge of sales.

(CONTINUED ON PAGE 158)

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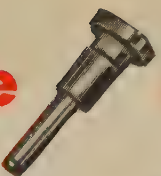

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European Letter . .

• Russian advantage in Berlin is legacy of settlements at Yalta and Potsdam . . . Only apparent solutions now lie in compromise agreement, force attack or withdrawal of Western Powers.

LONDON — Events recently served to underline the strength of the Russian position in Berlin. The Soviet rejection of the Allied notes leaves the Western Powers, not the Russians, in a quandary over what to do next. The Russian offer to feed the western sectors of Berlin in exchange for eastern currency weakens the Allied accusation that it is Russia's aim to starve out 2½ million Germans. The Allies have been powerless to prevent the introduction of a few more minor but intensely irritating Soviet traffic controls. There are reports of railway lines to the Western zones being taken up and removed.

It is no use minimizing the Russian advantage. It is a legacy of the settlements at Yalta and Potsdam which created in Berlin a small Allied enclave completely surrounded by Soviet occupied territory and dependent upon Russian good will for all its communications of the Russian and Allied positions. Even the most optimistic will have to admit that the great air lift cannot be maintained indefinitely on the present scale. Day by day, the Allies draw nearer to the end of the present uneasy stalemate. The essential impermanence of the effort to supply Berlin from the air is not simply a technical matter, but the difficulty lies in bringing in sufficient supplies when November fogs and December snows make flying difficult.

SOON the Western Allies will be faced with three possibilities: to reach a compromise agreement with the Russians; to impose their own solution, if necessary by force; or to withdraw from Berlin. Perhaps the best illustration of Russia's present tactical advantage is the fact that, of these three possible courses, the path of compromise is open to the West only if the Russians choose to take it. The Western Allies can propose a raising of the blockade in return for this or that concession—the use of Eastern currency in Berlin, the revival of reparations—but if the Russians do not decide to accept a compromise, the Western Powers will still be exactly where they were before —blockaded in Berlin. The area of their own free choice is restricted to the two remaining possibilities, a solution to their taste imposed, if necessary, by force or withdrawal. If the course of force is chosen, the important factor is their readiness to go to war to enforce it. The ultimatum might simply cover Berlin and take the form of a demand to the Russians to raise the blockade within a specified time. But the important factor would be the backing of the ultimatum by force. There should be no illusions on this point. The arrival of 60 superfortresses in Britain on a routine training mission does not constitute a threat of force. The Allies can bring home to the Russians the seriousness of their intention to make war only if they themselves are in fact serious. They cannot expect to frighten Stalin unless they are willing to go far enough to terrify their own publics. In other words, an ultimatum backed by the threat of force demands mobilization in western Europe and the United States, the concentration of aircraft and armor in western Germany, preparations for civil defense and at least the first steps toward a war economy. Bluff will not work. Either the Allies must intend war seriously or their ultimatum will have no more force than the recent note.

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IF the quarrel over Berlin is to be resolved by force, the responsibility for firing the first shot may lie with the West. This is one more illustration of the tactical strength of the Russian position. They can get what they want by doing nothing. To break out of the ring, to impose their will, to confront the Russians with the risk of war, the Western Powers would have to begin the shooting, to make the offensive troop movements, to say the word that would begin the carnage. Can a democratic society ever do that? Attacked, it will fight and win. But could it ever coldbloodedly start an atomic war, no matter in how just a cause? Yet to enter on the firm course and falter at the last obstacle would be fatal.

Yet if the immediate risks of the firm course are enormous, the ultimate risks of the alternative are no smaller. The consequences of a withdrawal are hard to assess, for the reason that most of them lie in the minds of men. Europe is involved in a war of nerves in which millions are engaged on either side.

It can be said, of course, that an Allied withdrawal from Berlin would not be the equivalent of a Munich. At Munich, an essential strategic advantage was thrown away, the Czech Maginot Line and the gateway to the German rear. No such sacrifice is involved in Berlin. Provided the western Allies coupled their retreat from the exposed and untenable Berlin enclave with strenuous measures to reinforce and reinsure their frontier along the iron curtain, it could be argued that their position would be stronger, not weaker. If a limited withdrawal from Berlin were to coincide with the coming into force of a fully implemented western defense pact, signed not only by the Western Union Powers but by the United States and the British Commonwealth, and guaranteeing the whole of western Europe against Soviet attack, it might be the means of securing what is otherwise still only a dream.

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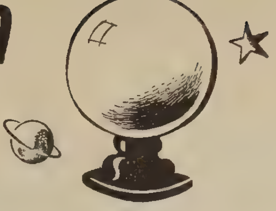

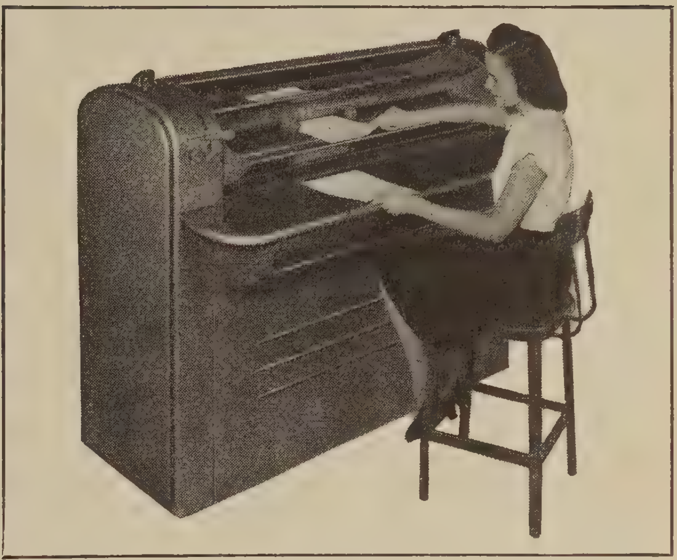

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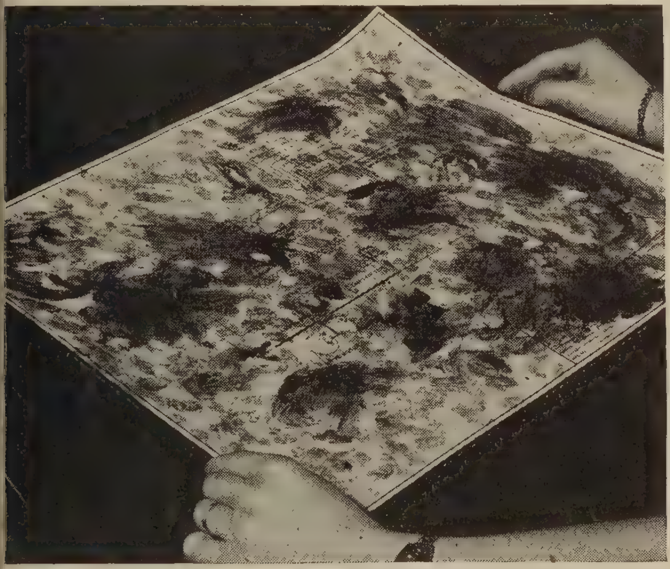

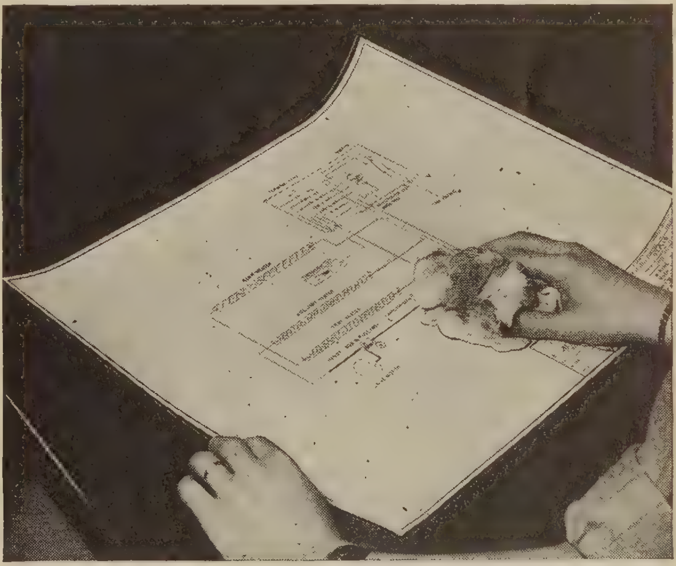

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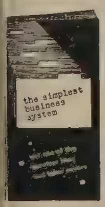

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Industrial News Summary...

- ***Steel Buyers Want to Use More Trucks***
- ***But Few Mills Can Meet Their Demands***
- ***Voluntary Steel Allocations Climbing***

STEEL buyers are turning in droves from rail to other forms of transportation wherever they can. The trend looms so large that steel executives in some areas are alarmed. But fabricators facing up to higher costs all along the line are finding this a fruitful field for cutting costs. The majority still mark their orders, "Ship as usual," but so many others are saying, "Ship via truck," that some mills have been forced to allocate truck shipments and charge extra for loading them.

Pressure for truck shipments is particularly heavy in the Midwest. Detroit buyers are finding they can pick up steel by truck in Chicago for just about $2 more than they pay a Detroit producer. If they can take water shipments from the windy city the price is about the same as that from a local mill. Or they can reach over to Cleveland and truck cold-rolled sheets into the auto city for no more than the Detroit f.o.b. mill price plus switching charge.

Against a quotation of $4.30 per 100 lb f.o.b. Detroit mill for cold-finished bars, a big Pittsburgh producer quotes $3.95. Jones & Laughlin's Pittsburgh price of $3.95 permits it to ship by rail into Detroit for only a few cents more than the Detroit mill's price plus switching charge. Or it can beat that price by trucking its cold finished bars into Detroit. This competitive condition exists only because J & L has set an f.o.b. mill price lower than that generally prevailing in the industry.

Using trucks to dodge high rail rates sounds good but has its bad points. Many steel mills can't move more than 20 pct of their output by truck. If all mills had facilities to load half their tonnage onto trucks there wouldn't be trucks enough to haul it. Some products are too big to be trucked. At some mills there is a tendency to accept truck shipments only for areas that are otherwise virtually closed by prohibitive rail freight rates. But new mills have better truck loading facilities and older plants are building them.

U. S. STEEL's President Ben Fairless foresaw this some years ago. He was worried about Pittsburgh: doubted that it could hold its position in normal times in the face of the rail freight rate increases being levied against it. This week he disclosed that two Big Steel subsidiaries, Carnegie-Illinois and American Bridge, had asked Eastern roads to slash rates to New York and Detroit by 40 pct. The customer is now paying this freight but he is learning that in some cases he can save by using trucks. Where he can't cut costs this way—most structural fabricated jobs move by rail—he is going to favor a closer mill as soon as he can. Either way the railroads stand to lose business at present rates.

Steel company district offices are now being bombarded by fabricators wanting to know why they can't get some steel or more steel now that fabricators pa the freight. It appears that freight absorption wa often a convenient excuse for not accepting orders i the past. In one case it was perhaps too hard to te a would-be customer he was not considered a likel prospect in "normal" times—that the mill was conce trating on back yard business it hoped to keep whe things got tough. On the quota increase angle t salesman will have to come up with a new excuse.

One that is certain to be heard—and as the month roll by it is becoming more fact than fiction—is volu tary allocation of civilian and military steel. On to of the freight car program and that for hot air hea ing, those for atomic energy and prefabricated house there has been added about 105,000 tons monthly o armament steel. An inland barge construction pr gram will put the bite on another 20,000 tons a mont beginning in the fourth quarter. Other programs ar certain to come in for more steel. The recently ap proved military program alone will take about 850 tons of hot-rolled sheets and the same amount of cold rolled sheets and perhaps 4250 tons of galvanize sheets each month.

CONSIDERED separately, not one of the voluntar allocation programs is a drop in the bucket if i be measured against total steel production. But as th allotments add up and are siphoned off the top of a already tight supply the commercial steel buyer has t scratch just a little harder each month.

Bethlehem Steel Corp. surprised the industry las week by cutitng back some of the price advances i had announced the previous week, bringing most o its prices into line with those of other major pr ducers. While some Bethlehem prices were necessaril competitive, others were just as obviously at plant too far from competing mills to require cuts. Despit the intense demand that exists today there has bee no disposition on the part of important steel pr ducers to charge what the traffic will bear. Best gues in the industry is that Bethlehem officials had thi principle in mind when they discovered some of thei new prices were a bit out of line.

The past week saw some additional nonferrou metals price advances. Rounding out the cycle wer moves in lead and zinc. Lead was up 11.5 pct to 19.30 per lb in St. Louis; zinc jumped 25 pct to 15¢ per l East St. Louis. In the ferrous field pig iron wa stronger, too. THE IRON AGE pig iron composite hit post-war high at $43.94 a gross ton. This is still abou $4 below the all-time record set in September, 192 During that month it averaged $47.83 per gross ton.

The steel industry set up to operate this week 93.5 pct or rated capacity, up half a point from las week's revised figure of 93 pct.

• **QUICK ACTION**—Pittsburgh's Industrial Development Council said that the Smoky City had a lot to offer metal fabricators. (THE IRON AGE, July 29, p. 127). Kelsey-Hayes, Detroit Wheel Co., thought so too, and wasted no time getting there as a result of the recent steel pricing change. They have bought the McKeesport plant of J&L. Portions of the plant will be surrendered before Oct. 1, 1948. Remainder of the plant will be turned over to K-H by Aug. 1, 1949, which is just about when J&L will complete work on the contracts that they have there.

• **HAND IN HAND**—Westinghouse Electric is going to buy 500,000 shares of stock in Boldwin Locomotive Works, Philadelphia, at $15.11 a share. This will give Westinghouse a 21 pct interest in Baldwin and—an indirect interest in the Midvale Co., Philadelphia maker of specialty steels, which is 64 pct owned by Baldwin. Westinghouse has been supplying Baldwin's electrical needs for some time. Directors of both companies have approved the deal—it will require no stockholder action.

• **OUR SCRAP CUT**—The Office of Industry Cooperation has been informed by Gen. Lucius D. Clay, U. S. Military Governor of Germany, that the sale of 1.2 million tons of German scrap has been authorized. Of this amount 440,000 tons has been earmarked for U. S. buyers. Some of it is already on the way. Here's how the rest has been dished out: 540,000 tons for Britain and 200,000 tons for the other Marshall plan countries.

• **GERMAN IMPORTS**—Bi-zone Germany has been authorized to procure $1.2 million worth of copper from the U. S. plus an equal amount of refined copper from Belgium under Economic Cooperation Administration allocations.

• **THINKING AHEAD** — The Jones & Laughlin Steel Corp. is doing quite a little thinking ahead—and acting, too. They are expanding their Benson mine output of iron ore. For years the Mesabi range whose deposits are dwindling has been J&L's chief source of supply. But that won't be the case within 10 years. The Benson mines will take care of that. The magnetic ores there are lean and locked in very hard rock. But the reserves are large and this year an output of 800,000 gross tons is expected—150,000 tons more than last year.

• **STEEL DIVIDENDS LAG**—Everything's going up. But steel dividends aren't. Stockholders got only 43 pct of the 1947 profits as compared with 49 pct in 1940 and 66 pct in the "twenties." Because of the increased cost of improvements for expansion in the industry, iron and steel producers had to retain 57 pct. of the year's profits. In addition—Federal income taxes were nearly $300 million, or approximately half again as large as the dividends which were almost $194 million.

• **RECORD CONSUMPTION**—More fuel oil, electric power, coal and coke were used by the iron and steel industry than in any previous year—war or peace—in its history. Here are the figures AISI shows: over 2 billion gal of fuel oil; over 90 million net tons of coal; over 58 million tons of coke; and 21 billion kwh of electricity.

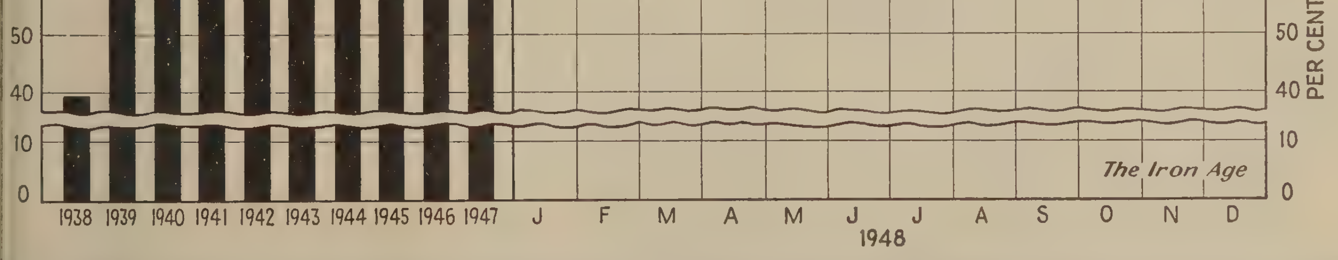
• **FRUITS OF RESEARCH**—The endless effort on the part of the iron and steel idustry in the field of stainless steels and their application has resulted in a record production of 333,000 tons of stainless finished products in 1947. Nine years ago ingot production was 180,000 tons annually. Last year ingot output was 520,000 tons.

• **STANDARD DESIGN**—The Locomotive Manufacturers Assn. has decreed that all locomotives—steam, deisel and electric—built in Britain in the future will be constructed to standard limits and sizes unless the customer specifies otherwise. Users will benefit by simplified running-shed maintenance and interchangeability of spares.

• **COLD DRAWN UP**—Bliss & Laughlin went f.o.b. and raised prices on all cold finished carbon bars, effective July 23. Their new prices are $4.00 per 100 lb at Harvey, Ill., $4.00 per 100 lb at Buffalo and $4.40 per 100 lb at Mansfield, Mass.

• **TO WESTERN EUROPE**—Alexander G. Bryant, president of the National Machine Tool Builders' Assn., is leaving for Europe at the request of Washington authorities. He will attend a series of conferences with manufacturers and Economic Cooperation Administration officials in Western Europe in an attempt for the machine tool industry to take the initiative in stimulating action to increase production facilities in cooperating countries.

Steel Ingot Production by Districts and Per Cent of Capacity



nt	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
7......	95.0*	89.5	89.0*	87.0	94.0*	99.0	87.0	102.0	102.0	101.5	106.0	78.0	98.0	93.0*
......	96.5	90.0	91.0	87.0	95.0	99.0	96.0	102.0	102.0	100.0	107.0	78.0	98.0	93.5**

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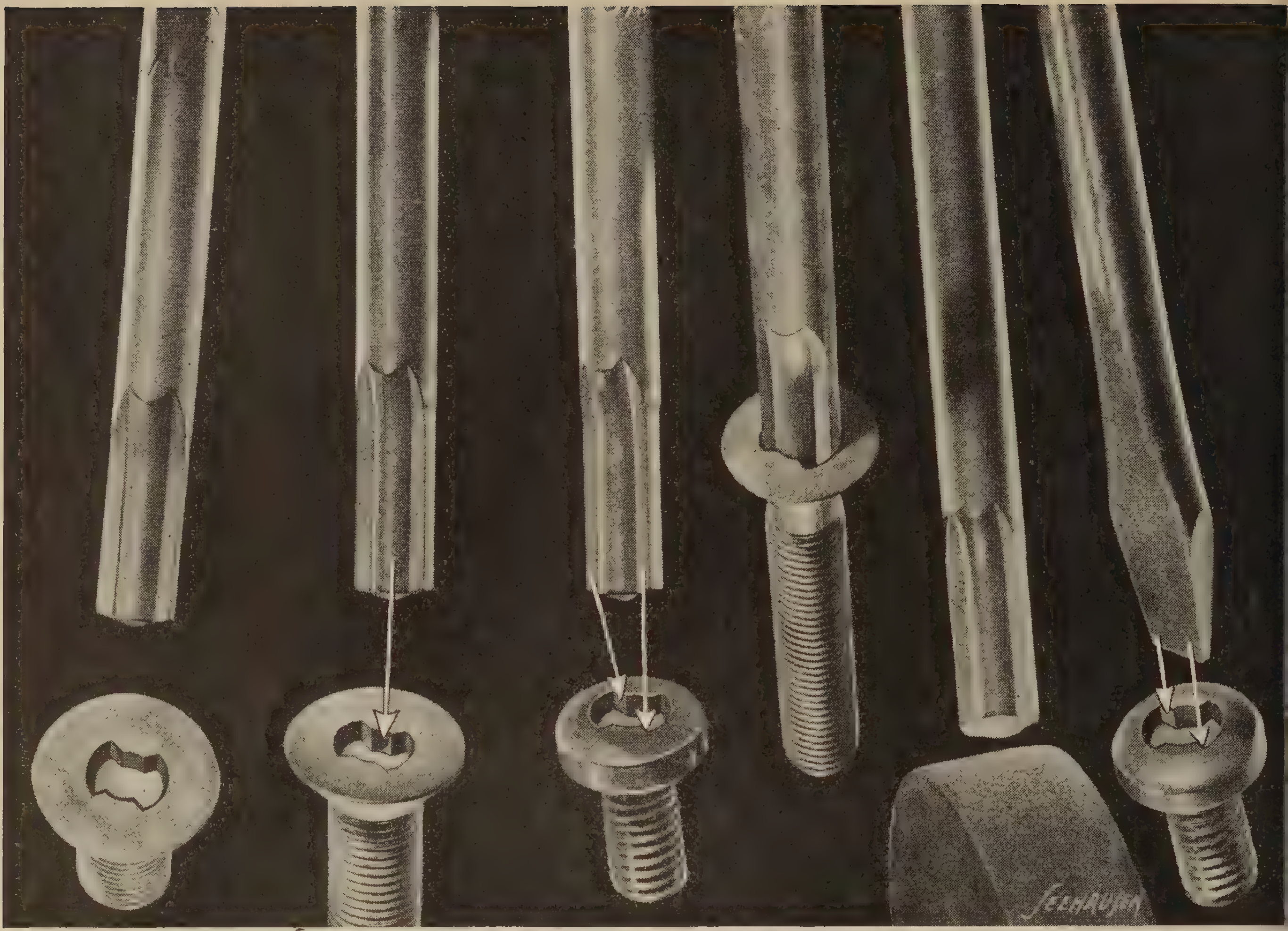


Here's How CLUTCH HEAD *Brings* *Slow-down To A Show-down...*

. . . the slowdown resulting from the use of fastener equipment that fails to measure up to the high speed tempo and safety requirements of today's modern assembly line production.

The Slowdown Of Poor Visibility is countered by CLUTCH HEAD'S wide roomy recess . . . an easy-to-hit target that inspires confidence and speed . . . even with "green" operators.

The Slowdown of Burred and Chewed-up Heads, the result of driver canting, is checked out by CLUTCH HEAD'S Center Pivot entry in dead center for automatic straight driving.

The Slowdown of Skid-Fear is eliminated by non-tapered driving engagement . . . exclusively a CLUTCH HEAD feature . . . Note the straight sides of the bit that engage the straight walls of the recess for absence of dangerous "ride-out" as set up by tapered driving.

The Slowdown of Refinishing Skid Damage takes a heavy toll of time and money. The safety and certainty of CLUTCH HEAD'S non-tapered driving is credited by users with *the elimination of damage* to fine surfaces.

The Slowdown of Operator Fatigue is also cancelled out by the non-tapered drive. No "ride-out" means easier, smoother driving with no end pressure to combat . . . therefore, no end-of-the-shift lag.

The Slowdown of "Fumble Spots," involving two-handed reaching into inside spots, is solved by the CLUTCH HEAD Lock-On. A simple reverse turn unites screw and bit as a unit for one-handed driving and easy access to inside assembly points.

The Slowdown of Tool Changing is offset by the rugged structure of the Type "A" Bit which has an established record of driving 214,000 screws non-stop. Note too, that this bit may be *repeatedly restored* to original efficiency by a 60-second application of the end surface to a grinding wheel.

The Slowdown of Field Service is checked out by the basic design of the Clutch Recess for operation with a common screwdriver or any flat blade . . . which need only be reasonably accurate *in width.*

Only America's Most Modern Screw offers this unique combination of features. Send for screw assortment, sample Type "A" Bit, and illustrated Brochure. Make your own appraisal and you will understand why users report production increases ranging from 15% to 50% over all other screws . . . recessed heads and hexagons, as well as slotted.

CLUTCH HEAD SCREWS

UNITED SCREW AND BOLT CORPORATION

CLEVELAND 2 CHICAGO 8 NEW YORK 7

Criticism of Industry For Recent Price Rises Surprises No One

Last to Move Blamed as Usual; Freight Absorption Called Lower Than 1 Pct

◦ ◦ ◦

By GEORGE F. SULLIVAN
Pittsburgh Editor

◦ ◦ ◦

Pittsburgh

• • • President Truman's criticism of the steel industry for raising prices came as no surprise to steel executives here. A few were a little hurt: They had hoped by being practically the last major industry to advance wages and prices they could avoid the usual bad-boy charges. In this connection, the President's reference to the price boost and to the pace-setting tradition of the industry was disappointing to some, more or less expected by others.

Steel people are trying to put across the fact that they ought not be blamed for the inflationary effects of the "third round." In this connection they have at least had some support from major automotive producers who for a change omitted reference to higher steel prices in announcing car price advances. Yet steel men know that in the public mind they'll take a lot of the blame. Several politicians have already indicated their intention of seeing that they do.

Privately some steel officials have said that the overall effects on the economy of the steel price increases are already being exaggerated. The results of the change to f.o.b. mill sales will be drastic for some customers and some mills. But at the moment, they say, its effect will hardly be inflationary.

Steel price advances were made after wage advances for a logical public relations reason. But had there been no wage advance steel prices would have gone up substantially anyway. Automobile and appliance prices would have risen even if steel didn't. In fact, most did following wage hikes. The third round is still in its infancy and its effects are only beginning to be felt.

Steel men admit that the tendency to blame steel for all price increases is old and they don't expect to be able to do much about it. They do point out, however, that of a $100 car price increase, perhaps no more than $20 comes from higher steel cost.

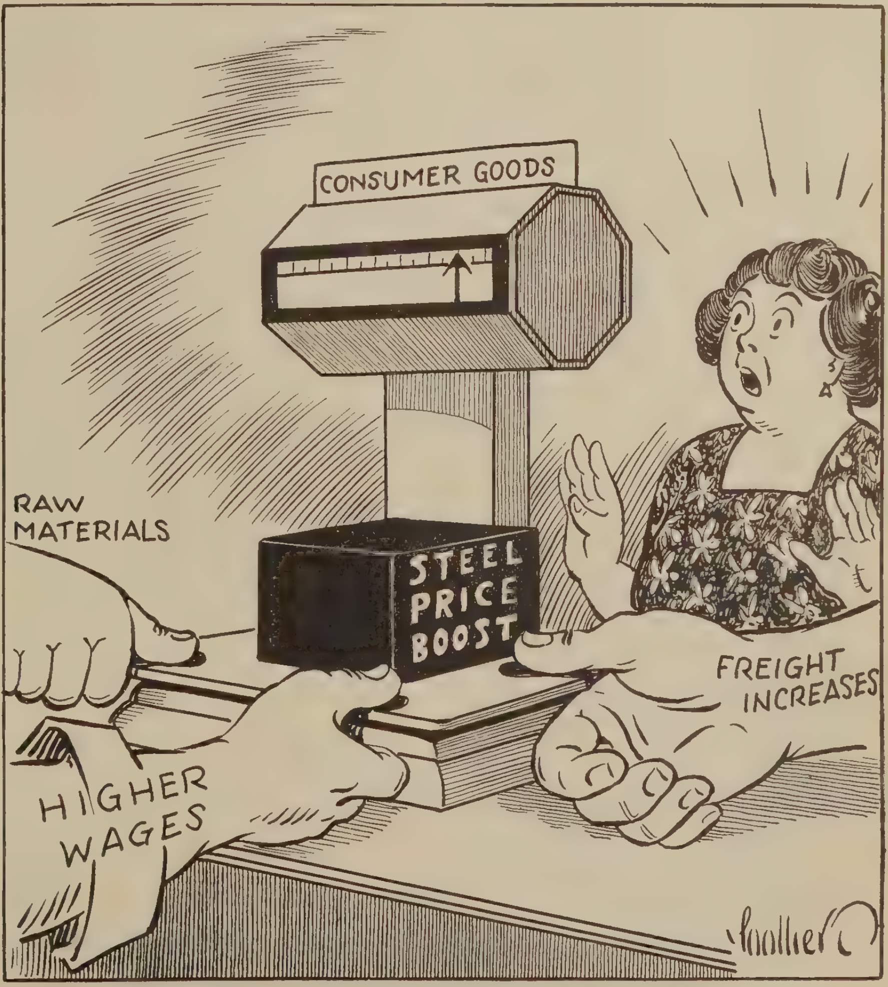
Enameling sheet steel prices generally advanced about 12 pct. This adds 88¢ to the steel cost of a porcelain enamel bathtub; on one popular model gas range the boost in steel cost was $1.10; on a washing machine 40¢; on a kitchen cabinet 34¢. The steel man doesn't question the need for price increases on these lines—doesn't attempt to weigh the extent of other cost increases—merely hopes they won't all be blamed on steel.

Like steel producers, fabricators' raw material costs are only part of the picture. Irving S. Olds, U. S. Steel board chairman, pointed out last week that for each $1 increase in labor costs his company experienced a $1.30 increase in the cost of purchased goods and services.

The switch to an f.o.b. mill method of marketing steel has been widely blamed for sharp increases in total cost of steel to consumers. Well informed observers' call this ill-informed thinking. Top steel evecutives have declined to estimate the amount they were spending annually in freight absorption, but a reliable estimate places it at less than 1 pct of total sales for the industry.

On certain products shipped to certain areas the freight absorption has been high. While the change to f.o.b. mill prices left some con-

Helping Hands



sumers' costs virtually unaffected, others were seriously hurt. These high absorption figures and the individual hardship cases tend to obscure the overall effect of the change on the national economy.

The total freight absorption bill of U. S. Steel Corp. in 1947 was reportedly in the neighborhood of $12 to $15 million. This estimate is believed to be reliable though officials of the corporation have indicated only that its absorption was a matter of "cents per ton," which would certainly place the total at less than $20 million. A few other steel firms absorbed proportionally as much as Big Steel but many were on a virtual f.o.b. basis long before they made the official switch.

On this basis the industry's total expenditure last year in equalizing freight to meet competition did not exceed $50 million, if that. Therefore, on a total steel sales volume in excess of $5 billion the freight absorption was less than 1 pct of the cost of all steel bought last year.

Granite City Steel Prices

Granite City, Ill.

• • • **Old and new** f.o.b. mill base prices announced July 26 by Granite City Steel Co., in cents per lb, are:

	Old Price	New Price	Increase per ton
Cold-rolled sheets	3.65	4.20	$11
Enameling sheets	4.05	4.60	11
Electrical sheets (elec)	5.75	6.15	8
Electr. sheets (motor)..	6.40	6.90	10
Galv. culvert sheets	5 00	5.40	8
Copper iron sheets......	5.30	5.70	8

Republic Gives Details On Recent Price Rises, Lists Producing Points

Cleveland

• • • **Following** is a detailed listing of recent price changes announced by Republic Steel Corp., together with points of production of the items named. All prices are f.o.b. these producing points and are in cents per lb unless otherwise noted.

PRODUCING POINTS

Product	Old	New	Chicago	Cleveland	Buffalo	Warren	Canton	Massillon	Youngstown	Gadsden
Carbon forging billets, net ton..................	$54.00	$61.00	x	x	x	....	....	....	....	....
Tube rounds, net ton..................................	$70.00	$76 00	x	x	....	....	x	....	....	....
Bars, carbon, OH..	2.90	3.35	x	x	x	....	x	....	x	....
Bars, def. reinforcing..................................	2.75	3.35	x	x	x	....	....	....	x	....
Bars & small shapes (rail steel).............	2.75	3.35*	....	....	....	....	....	....	....	....
Plates	2.95	3.40	....	x	....	....	....	....	....	x
Structural shapes, bar mill.........................	2.80	3.25	....	....	....	....	....	....	....	x
Skelp	2.90	3.25	....	....	....	x	....	....	x	....
Tie plates**	3.65	4.05	....	....	....	....	....	....	....	....
Bars, H.R. alloy...	3.30	3.75	x	....	x	....	x	x	....	....
Alloy billets, blooms, slabs, net ton........	$58.93	$63.00	x	....	x	....	x	x	....	....
Cold-finished alloy bars†...........................	4.10	4.65	....	....	....	....	....	x	....	....
Cold-finished carbon bars‡.........................	3.55	4.00	....	....	....	....	....	x	....	....
Sheets H.R. 18 ga & heavier....................	2.80	3.25	....	x	....	x	....	....	....	x
Sheets, C.R.	3.55	4.00	....	x	....	x	....	....	....	....
Strip, H.R.	2.80	3 25	....	....	....	x	....	....	....	....
Strip, C.R.	3.55	4.00	....	....	....	x	....	....	....	....
Sheets, galvanized	4.50	4.95	....	....	....	....	x	....	....	x
Sheets, enameling	3.95	4.40	....	x	....	....	....	....	....	....
Electrical sheets (elec)................................	5.30	5.95	....	....	....	x	....	....	....	....
Silicon, strip	......	6.20	....	....	....	x	....	x	....	....
Sheets, Paintlok & Zincbond......................	4 70	5.15	....	x	....	....	....	....	....	....
Wire Rods, H.R..	2.85	3.40	x	....	....	....	....	....	....	x
Mfrs wire, low carbon.................................	3.80	4.15	x	....	....	....	....	....	....	x
Mer. qual. annld. wire.................................	4.45	4.80	x	....	....	....	....	....	....	x
Mer. qual. galv. wire...................................	4.90	5.25	x	....	....	....	....	....	....	x
Std. wire nails & staples, col.....................	......	103	x	....	....	....	....	....	....	x

PIPE AND TUBE INCREASEES

	Dollars per ton
Buttweld pipe, ½ to 3 in..................................	$8
Electricweld pipe, std & line, 2⅝ to 16 in. OD	11
Water well casing, 3¼ to 8¼ in......................	11
Oil country casing, approximately..................	12
Oil country tubing	10

* Moline. ** Pittsburgh. † Also Gary, Beaver Falls, Pa., Hartford, Los. Angeles.
‡ Also Niles, Ohio.

Bethlehem Cuts Back Some Recent Advances "To Meet Competition"

Bethlehem

• • • **Bethlehem Steel Corp.** cut back its recent price advances on 27 products effective July 28. The

The adjustment was made, the company said, "in order to meet competition which we found to exist in certain of our products." For points of production on these products see THE IRON AGE, July 29, p. 123. Following are former and new base prices in cents per lb and the amount of the reduction in dollars per ton:

PRODUCTS	Old Price July 27, 1948)	New Price July 28, 1948)	Reduction Per Ton
Bars, concrete reinforcing	3.40	3.35	$1
Fgd steel rwy axles........	5.25	5.20	1
Std. T rails (No. 1) over 60 lb	3.25	3.20	1
Std. T rails (No. 2) over 60 lb	3.15	3.10	1
Joint bars for rails over 60 lb	4.35	4.25	2
Tie plates for rails over 60 lb	4.15	4.05	2
Light T rails 40 lb and under	3.60	3.55	1
Light T rails 60 lb......	3.60	3.55	1
Carb. H.R. sheets 72 in. and narrower........	3.30	3.25	1
Carb. H.R. sheets 60 in. and narrower	3.30	3.25	1
Carb. C.R. sheets 11 ga. and thinner, 72 in. and narrower	4 10	4.00	2
Carb. C.R. sheets 14 ga. and thinner, 48 in. and narrower	4.10	4.00	2
Galv. sheets 10 ga., 48 in. and narrower......	4.50	4.40	2
Galv. copper bearing culv. sheets, 16 ga.....	5.15	5.00	3
Carb. H.R strip............	3.30	3.25	1
Carb. C.R. strip..........	4.10	4.00	2
Mayari R H.R. sheets, 72 in. and narrower..	5.05	4.95	2
Mayari R H.R. sheets 60 in. and narrower..	5.05	4.95	2
Mayari R C.R. sheets 13 ga and thinner, 60 in. and narrower........	6.15	6.05	2
Mayari R C.R. sheets 14 ga. and thinner, 48 in. and narrower........	6.15	6.05	2
Mayari R galv. sheets 10 ga., 48 in. and narrower	6.85	6.75	2
Mayari R H.R. strip....	5.05	4.95	2
Mayari R C R. strip....	6.15	6.05	2
H.R. alloy bars (except Mayari R)	3.85	3.75	2
H.R. Mayari R bars and small shapes	5.20	5.10	2
H.R. bars—O.H.—crucible analysis	5.55	5.50	1
H.R carb. bars and small shapes	3.40	3.35	1

Kaiser Fontana Prices

Oakland, Calif.

• • • **Kaiser Co.,** Iron & Steel Div. on July 26 announced a wage increase averaging 13¢ an hr. and a price increase averaging $9.83 a ton.

(F.o.b. Fontana, cents per lb)

	Old	New	Increase Per Ton
H.R. sheets (to 16 in wide)..........	3.65	4.15	$10
H.R. strip	3.90	4.40	10
C.R. strip	4.95	5.50	11
Bars, carbon	3.55	4.05	10
Bars, reinforcing	......	4.05	....
Bars, H.R. alloy..........	4.25	4.75	10
Plate	3.80	4.30	10
Structural shapes	3 75	4.25	10

See 84 Million Ton Lake Ore Movement on Midpoint Figure

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By **BILL LLOYD**
Cleveland Editor

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Hull-Rust mine, operated by Oliver Mining Co., U.S. Steel Corp. subsidiary

Cleveland

• • • **Approximate midpoint** of the 1948 iron ore season on the Great Lakes was reached last week and if past performance is any indication, the 84 million gross ton movement of Lake Superior District iron ore as predicted by the experts last spring is more a matter of fact than fiction.

The following table, showing season tonnages for the past 7 years and the approximate date when the half-way mark was reached, with 1948 tonnage moved to date, indicates that July 29 or its immediate vicinity is the theoretical midpoint of the 1948 season

Year	Season Lake Tonnage	Approximate Date When Half Total Loaded
1941	80,116,000	Aug. 1
1942	92,076,000	July 29
1943	84,405,000	Aug. 9
1944	81,170,000	July 28
1945	75,715,000	July 25
1946	59,357,000	Aug. 18
1947	77,898,000	Aug. 1
1948	84,000,000 (est.)	July 29

Lake Superior district iron ore loaded to July 26, 1948 totaled 40,806,613 gross tons, which is 1,193,383 gross tons short of 42 million tons, or half the estimated 1948 movement. At the average daily loading of the past few weeks, 3 days loadings will be required to reach the half-way mark of 42 million gross tons.

Lake Superior district iron ore on hand at furnaces and Lake Erie docks on July 1, 1948 totaled approximately 27,000,000 tons, or 26,964,508 gross tons, according to the monthly report of the Lake Superior Iron Ore Assn. On July 1, it was estimated that about 2.5 million gross tons was in transit on the lakes and rails from the lake ports, making the total tonnage of Lake Superior iron ore available July 1, some 29,500,000 gross tons.

Ore loaded by lake up to July 1, 1948 was 31,014,000 tons, which means that the additional tonnage required to make up an 84 million ton movement would be 53 million tons. It has been estimated that approximately 1 million tons of all rail ore will be shipped after July 1, indicating that the total tonnage expected to be available after July 1 and until the first of next season will be 84 million tons, a conservative estimate.

Assuming that 84 million gross tons will constitute the 1948 lake season movement, and with consumption in the 9-month period from July 1, 1948 to Apr. 1, 1949, estimated at the rate of 7,200,000 gross tons per month or 64,800,000 gross tons, would leave 18,700,000 gross tons on hand at storage yards on Apr. 1, more than enough, barring a serious emergency.

On the basis of furnace capacity, consumption might increase to a maximum of about 7,400,000 tons per month by the spring of 1949. If so, total consumption from July 1 to April 1 might be somewhat above the rate estimated. However, total consumption for 6 months, during the period January to June 1948 was 38,341,534 or an average of 6,390,255. Consumption

(CONTINUED ON PAGE 124)

Art of Selling Now Being Revived By Some Manufacturers in

General Electric Co. Soon to Launch Big Promotion On Materials Handling Methods and Equipment

New York

• • • **As the consuming** public exercises increasing discrimination and selectivity in its buying, competition between manufacturers always becomes proportionately keener. Business survival then depends more and more on (1) producing a superior product, (2) reducing costs, and thus prices, or (3) reviving the almost-forgotten art of selling.

All three of these methods of meeting or beating competition have long been considered good business. But even business admits that that the seller's market of the past several years has provided little incentive for intensive effort in this direction. For one thing, most of business has been too preoccupied with an almost overwhelming struggle to obtain and secure a life line of raw materials.

All the while business leaders have not lost interest in the possibilities of better products, lower costs and prices and better salesmanship. But wartime scarcities of materials and frequently changing wartime controls and restrictions over business have posed more immediate and pressing problems. As a result, what is normally considered good business practice has in many cases been thrown out the window, or at least pigeonholed.

Nevertheless, business has known all along that these competitive "musts" would have to be restored, and, in fact, intensified—sometime. With this in mind, enormous sums of money have been poured into research programs in the quest for new and better products. Never has industry spent more to learn how to make products which would touch the springs of desire in the consumer breast and which would at the same time conform with the limitations of the family pocket book.

Cost-price studies have also been maintained. They are in fact too basic a part of modern accounting procedure to be eliminated. They are also needed to provide the data necessary for reports to government and stockholders.

But there is a whale of a difference between studying costs and prices—for accounting purposes—and the far more difficult task of actively reducing costs and prices. To say that this job is tough is trite. It is complex. It is sometimes frustrating (ask any embattled loser in steel's recent fight against inflation). And it sometimes means disrupting an entire production line or plant and overcoming the inertia of a status quo that has long been jealously guarded as the "best."

Of the various means of meeting competition, selling has suffered most. It just hasn't been necessary. Some manufacturers have permitted their sales ranks to melt away. Top-notch salesmen leaving the firm have not been replaced. They have not been replaced because, for the moment at least, they haven't been needed. With some firms selling has been resolved to a mechanical process of simply taking orders —by telephone in some instances.

Other firms have tried to keep their trained selling forces intact, though frequently they have lacked the challenge and incentive of a choosey public. And they have had a hard time reconciling expensive sales forces in the face of crying demand. During these times many top-notch salesmen have been almost totally occupied by the strange (for them) task of explaining to customers that their backlog orders would be filled at the earliest possible moment. This is still true in some firms.

The last year, however, has seen a revival of interest in selling. Sales forces have been increased and trained for the all important job ahead. Promotional ideas have been developed with an eye to giving the salesmen ammunition with which to fire away at prospective customers.

Many of these selling plans which have been brewing for a year or more are only now going into effect. Others are still in the planning stage. Other factors being equal, the companies that reach the public first with the most and best in the way of sales promotion ideas —followed up by a sizable force of well trained salesmen—will have a distinct advantage.

General Electric Co.'s More Power to America program is a good example of a well-aimed sales promotion campaign. The program is ambitious in aim and scope. And the company has backed it generously with money and personnel.

Anticipation Of Buyers Market

By BILL PACKARD
Ass't. News, Markets Editor

The theme of the program is increased electrification and modernization of American industry. One of its chief aims, in addition to selling GE products, is to get everyone who has a stake in the electrical industry to participate.

The program effectively emphasizes the advantages of electrification and modernization. It embraces a series of educational programs, each featuring a motion picture or slide film, and a manual containing engineering and application data to accompany it. Each of these educational programs is devoted to an industry or a major process within an industry.

Programs which have so far been emphasized include laundry electrification, resistance welding, load-center substations, and oil-field electrification. The programs have been offered to such associates as the electric utility companies, the electric machinery and equipment manufacturers, electrical contractors and distributors. Working with power sales engineers, or in collaboration with General Electric field engineers, these organizations then present the programs to every branch of industry where the message involved will be of value.

The newest of these programs is on the subject of materials handling in receiving, shipping and warehousing operations. Like its predecessors, this program consists of two parts—a movie and a manual.

The movie is in color. It illustrates all types of materials handling equipment, showing installations in which each is best used. The manual contains data on engineering problems, power distribution and the selection of equipment for materials handling.

Both picture and manual were prepared in cooperation with trade associations and equipment manufacturers. Groundwork for their presentation to the public this fall has already been laid by a series of press conferences in several key cities. General Electric is now arranging for the sponsorship of the program throughout the country by equipment manufacturers, electric utilities, and local GE offices.

The entire subject matter contained in the movie and manual is aimed at appealing to the competitive desire of firms to cut costs and save time through efficient, mechanized materials handling. In addition to illustrations of equipment and methods of materials handling, specific examples of excellent results obtained by some firms are included.

Among those listed are a ceramics manufacturer who reduced his packing time 75 pct by instituting a unit-load system with cartons holding 144 instead of 6 parts. A rug manufacturer saved $96 a day by using a crane truck to reduce his unloading time by two-thirds. And a diesel-electric locomotive saved one manufacturer $650 the first month over a steam switch engine.

GE is quite proud of this program, not without reason. They have a lot invested in it. It will be hard to measure the products which will be sold as a direct result of it. At least it represents an all out effort in sales promotion. This is something which has been lacking for a long time. It is also something of which we shall doubtless see a lot more in the times ahead.

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OLD AND NEW: GE's promotion campaign, currently focused on the subject of materials handling, is packed with pictorial descriptions of the old and new ways of doing the same job. GE spokesmen maintain that "there is still far too much use being made of the old hernia method of moving materials from one place to another (see photo at far left). "This old, costly, time-consuming method of unloading a boxcar with stevedore trucks may have been effective 30 or 40 years ago," they say. "But, today, with the cost of labor what it is and the necessity of meeting increased production schedules, it isn't only out of date." "It's bankruptcy, in many cases, not to change." In the second photo a battery-operated fork truck is shown unloading a boxcar of unit-load material.

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Industrial Briefs . . .

• COLOR FILM—A new 16mm color sound film, "Grinding and use of Basic Lathe Tool Cutter Bits," has been announced by by the South Bend Lathe Works, South Bend, Ind. It is Film III in the series of films based on the book "How To Run A Lathe." The films are distributed on a free loan basis and are also available for outright purchase.

• REQUESTS PERMIT—Texas Eastern Transmission Corp., Shreveport, La., owners and operators of the Big and Little Big Inch pipe lines, has applied to the Federal Power Commission for a construction permit which would increase deliveries of natural gas to consumers in the East by 235 million cu ft daily. The increase in deliveries would be brought about as a cooperative effort with Texas Gas Transmission Corp.

• CHANGES NAME — Announcement has been made that the Hunter Pressed Steel Co., precision spring manufacturer of Lansdale, Pa., has changed its corporate name to Hunter Spring Co. The change of the firm's name involves no change in corporate affairs.

• REPRESENTATIVES—Two additional sales representatives for L. J. Wing Mfg. Co. in Canada have been announced. J. C. Davis, Ltd., Winnipeg, will represent Wing heating, ventilating and combustion products in Manitoba, Saskatchewan and Alberta. Control Equipment Co., Toronto, will represent King in Ontario.

• ENLARGES BUILDING — San Francisco branch of the Foxboro Co. is now settled in its enlarged quarters. The company, with its main office and factory at Foxboro, Mass., is one of the leading makers of industrial instruments for measurement and control of process variables.

• ACQUISITION — Columbia Metal Corp., Seattle, has purchased the plant built at Salem, Ore., during the war for the purpose of producing alumina from clay at a cost of $5 million, for approximately $750,000. Under terms of the sale, Columbia must maintain the basic structure so that at any time within the next 20 years it can be returned to the use for which it was originally erected.

• APPOINTS AGENCY — J. Bishop & Co., platinum works, Malvern, Pa., has appointed Lee Ramsdell & Co., Inc., Philadelphia, advertising counsel for its Industrial Tubes Div. The Ramsdell agency handles the Medical Products Div. advertising.

• ASSETS ACQUIRED—Assets of the Motorette Corp., Cheektowaga, N. Y., have been sold for $55,000 to the Delavan Welding Co. Inc., Buffalo, under ageneral court assignment for the benefit of Motorette creditors. Delavan Welding, whose local plant was swept by fire, will occupy the Motorette plant.

• AGENCIES — The R. M. Wright Co., Detroit, will represent Mead Specialties Co., Chi- in the state of Michigan, except the lower tier of counties, eastern Pennsylvania and lower New Jersey. Delaware and Maryland will be handled by the Jackson-Walter Co., Philadelphia.

• HONORED — Robert A. Hipke, sales manager, Sivyer Steel Casting Co., Milwaukee, has been elected president of the Alloy Casting Institute at the annual meeting of the Institute in Hot Springs, Va.

• WAREHOUSING SPACE—Wendt-Sonis Co., Hannibal, Mo., manufacturers of carbide cutting tools, has set up new warehousing facilities at 1361 West Lake St., Chicago, with J. J. Cardenhire as manager.

Lake Ore Movement

(CONTINUED FROM PAGE 121)

exceeded 7 million gross tons per month in January 1948, and also in October and November of 1947. However, total consumption in 1947 was 80,806,627 gross tons or 6,734,885 tons per month.

Addition of new furnaces by Carnegie-Illinois Steel Corp. at South Chicago and by Pittsburgh Steel Co. at Monessen, Pa., brought the total number of furnaces to 194. Of these, 180 were in blast July 1, 1948, two more than a month ago and 30 more than a year ago.

Low point in stocks in 1948 was 16,022,000 on Apr. 1. Low point in stocks in 1947 was 13,055,000 on May 1. It follows that even if lake shipments do not quite reach 84 million or if consumption is somewhat increased, then stocks on hand Apr. 1, 1949 will be somewhat less than indicated.

In the opinion of some observers, there are two threats to the 84 million ton movement. The first is weather, which is always an imponderable factor, particularly in the late season movement. Second is ore storage space, a factor brought into sharp focus by the quality of coke. A number of large consumers of iron ore cannot blow blast furnaces as fast as they did at one time, or would like to, because of the quality of the coke.

Boat capacity is not a serious problem at the present time. Canadian bottoms are being offered and accepted, as a result legislation authorizing a temporary suspension of the coastwise shipping laws and permitting Canadian carriers to haul ore between U. S. ports. Fewer Canadian bottoms will be offered after Aug. 15, when the grain traffic begins to pick up.

Bethlehem Pacific Coast

San Francisco

• • • **Bethlehem Pacific** Coast Steel Corp. has posted new prices at its West Coast plants. The new f.o.b. mill prices and the old prices in cents per lb are:

Seattle, S. San Francisco, Los Angeles:	Old	New	Increase Per Ton
H.R. strip	3.75	4.25	$10....
Bars, carbon	3.60	4.10	10
Bars, reinforcing	3.45	4.10	13
Structural shapes	3.80	4.30	10
Los Angeles only:			
Wire rods	......	4.10	....
Bars, H.R. alloy	4.30	4.80	10
Seattle only:			
Plates	3.80	4.30	10
Tie plates	4.00	4.50	10

ICC Makes Interim Freight Increases Continue In Effect

Washington

• • • **Interstate Commerce** Commission has now made permanent—with slight modification—the interim freight rate increases granted the railroads since October, 1947.

Generally speaking, these increases range from 20 pct to 30 pct, with certain exceptions, together with an increase of 15 pct in charges for protective services.

Specifically, the ICC continues authorization for general increases in basic rates as follows: 30 pct within eastern territory; 25 pct within southern territory and within zone of eastern trunkline territory,. and interterritorially between those territories and eastern territory. A reduction of 2½ pct in the April interim increase between western territory, other than zone 1 of western trunkline territory, and zone 1 of western trunkline territory, and, 20 pct in the remainder of western territory—all subject to stated limitations.

Exceptions to the general increases cover most of the products of interest to the metalworking industry. Rates were adjusted upward and downward on these commodities, resulting in a small addition to rail revenues. Included among the exceptions are the following:

Anthracite coal, bituminous coal, except lignite, and coke, increase 20 pct, maximum 2¢ per 100 lb.

Iron ore or iron sinter: to the upper lake ports increase ½¢ per 100 lb. Increase all other rates 20 pct, maximum 1½¢ per 100 lb.

Iron ore tailings, furnace slag, not including ground open hearth basic slag: maximum 1½¢ per 100 lb.

Aluminum, copper, lead, and zinc ores and concentrates, and iron pyrites: maximum 1½¢ per 100 lb.

Manganese ore, chrome ore, dolomite, magnesite: maximum 6¢ 100 lb.

Ground open hearth basic slag: maximum 8¢ per 100 lb.

Refractories: maximum 6¢ per 100 lb.

Railway car or locomotive axles, iron and steel articles, manufactured, iron and steel, iron and steel scrap, nails, spikes and staples, pig iron, iron and steel rails and railway track materials, tin or terne plate, scrap, tin mill, black plate, scrap, railway car or locomotive trucks and truck frames, iron or steel wire, not woven, knocked-down iron or steel tanks and tank towers and iron or steel tank or tower material, roofing, siding, or sheathing, iron or steel, aluminum, copper, lead, and zinc metal or alloys and articles made thereof.

Charges for handling iron ore at both upper and lower lake ports were increased 18 pct. No increase in charges for storing iron ore at the lower lake ports was authorized. Rates and charges for the switching of coal, coke and iron ore within eastern territory, where such charges are presently absorbed in whole or in part by line—haul carriers, may be increased 18 pct, provided the absorptions by line-haul carriers are likewise increased by that percentage.

Joint rates between rail carriers and water or motor carriers may be increased to the same extent and in like manner as is authorized for all-rail rates.

Bethlehem Raises Salaries

New York

• • • **E. G. Grace,** chairman of Bethlehem Steel Corp., announced on July 26 a 9 pct pay increase, effective July 16, 1948, for salaried employees in the steel division. The percentage pay increase applies to about 14,500 salaried employees in the steel division earning $750 per month or less, with a minimum increase of $17 per month. The compensation of salaried employees receiving in excess of $750 per month will be considered on an individual basis.

50 YEARS AGO

THE IRON AGE, *August 4, 1898*

• "The first screw factory in the U. S. is claimed to have been established in 1810 by an Englishman, Hardiman Philips, in Philipsburg on the western slope of the Allegehanies. Machinery for the plant was brought from England and hauled from Philadelphia to Philipsburg by wagon. The venture soon became known as 'Philips Folly,' failure due in part to the inaccessible location of the plant, and the machinery was shipped back to England."

• "It is reported that a man in the Klondike brought ten kegs of nails from Fort Yukon a few days ago, and refused a cash offer of $4,500 for the lot. He asked and got $5.00 a lb."

• "We are not inclined to share the fear, expressed in some quarters, lest the Japanese, who only of late have opened their minds to modern ideas, may copy our inventions and imitate our methods of manufacture to such an extent as to drive our goods out of their markets. There are people who fear that Japan may even become a producer for export and capture world markets. These people believe it is suicidal for America and Europe to put improved machinery into the hands of Japanese people."

• "A provision in the new constitution permits cities and towns in Kentucky to exempt new manufacturing enterprises from all municipal taxes for a period of five years."

• "The steady movement of the cotton manufacturing industry from the North toward the source of supply of the raw material is clearly illustrated in the fact that of 74 new cotton mills planned or built during the first six months of this year, 71 were in the Southern states."

• "According to the latest statistics, the population of Europe is now 380 million. This represents a gain of 37 million in the past ten years."

Weekly Gallup Polls . . .

Poll Reveals Opinions On Civil Rights Program

Princeton, N. J.

• • • Wide differences of public opinion exist on the four major proposals of the Truman Civil Rights Program, which is almost certain to be an important issue confronting this special session of Congress, according to George Gallup, director, American Institute of Public Opinion.

In order to sound out attitudes on this program held by voters not only in the South but in the nation as a whole, the institute has surveyed a national cross-section on the proposals for a Federal anti-lynch law, abolition of poll taxes, a Federal fair employment practices law (FEPC), and prohibition of segregation in interstate travel.

Of the four proposals the one which southern voters oppose most overwhelmingly is the prohibition of segregation on trains and buses traveling between states, followed by a Federal FEPC and a Federal anti-lynch law. The South as a whole actually approves doing away with poll taxes, although a majority of voters in the seven states still collecting the taxes want them retained.

The rest of the country, on the other hand, approves the proposals for a Federal anti-lynch law abolition of both poll taxes and travel segregation, and are about evenly divided when it comes to a national FEPC.

This analysis of voter opinion is based on the following series of questions asked by the institute:

SECREGATION IN BUSES AND TRAINS

"Do you think Negroes should or should not be required to occupy a separate part of a train or bus when traveling from one state to another?"

	Should	Should Not	No Op.
	Pct..	Pct	Pct
National	42	49	9
South	84	12	4
Outside of South	36	54	10

NATIONAL FEPC

"How far do you think the federal government should go in requiring employers to hire people with regard to race, religion, color or nationality?"

	National	South..	Outside South
	Pct	Pct	Pct
All the way	32	..9	36
None of the way	45	68	42
Depends on type of work	7	3	7
Should be left to state government	2	2	2
Don't know	14	18	13

ANTI-LYNCHING BILL

"At present, state governments deal with most crimes committed in their own states. In the case of a lynching do you think the Federal government should have the right to step in and deal with the crime—or do you think this should be left entirely to the state government?"

	Federal	State	No opin.
	Pct	Pct	Pct
National	48	41	11
South	23	65	12
Outside South	51	38	11

POLL TAXES

"Some Southern states require every voter to pay a poll tax amounting to about a dollar a year before they can vote. Do you think these poll taxes should be abolished?"

	Abolish	Retain	No opin.
	Pct	Pct	Pct
National	65	24	11
South	48	43	9
Outside South	67	21	12
Poll Tax States	36	56	8

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Lack of Discipline Scored Here and Abroad As Major Weakness In Education Today

• • • Here in the United States six out of 10 people think Junior and Sis are getting a better schooling than their father and mother did. People in three British Commonwealth nations, England, Canada and Australia, have an even stronger feeling that education is better today than when they went to school.

But, in contrast to the optimism of English-speaking peoples the citizens of the Scandinavian countries, and Holland, Italy and France are more inclined to be pessimistic about the progress made by their educational systems.

The survey was conducted simultaneously in the eleven nations, all using this question:

"Do you think children today are being educated better or worse than you were?"

The comparative results:

	Better	Worse	Same	No Op.
	Pct	Pct	Pct	Pct
Canada	74	12	10	4
Australia	78	9	9	4
Britain	64	19	11	6
U. S. A.	59	26	10	5
Finland	54	21	17	8
Norway	44	30	16	10
Sweden	26	37	29	8
Denmark	21	45	21	13
Italy	20	40	23	17
France	12	50	27	11
Holland	10	46	27	17

In each nation the most universal complaint about present day education is the lack of discipline.

Educators here and abroad probably would argue that complaints should be aimed at the home as well as at the school; that parents have just as big a job to do in child training as teachers. Many of the people surveyed likewise put the major blame for poor discipline on the fathers and mothers themselves.

Comments about the lack of discipline training ran high in all countries, higher than any specific criticism of the subjects taught. Americans, when asked to name their main criticism of education today, follow the pattern noticeable in all the countries. In order of frequency mentioned these are the complaints they registered:

1. Lack of discipline, lack of fundamental character training.
2. Criticism of subjects taught and their presentation.
3. Criticism of parents for lack of interest and control.
4. Too many extracurricular activities.
5. Schools inadequate and overcrowded, old textbooks, etc.
6. Criticism of teachers, qualifications, shortages, competency, etc.
7. Teachers underpaid.

Construction Steel . .

• • • **Fabricated steel awards** this week included the following:

520 Tons, Savannah, Ga., boiler recovery unit, Union Bag & Paper Co., through Morton-Tuttle Co., Boston, to American Bridge Co., Pittsburgh.
355 Tons, Jefferson Co., Ala., highway bridge, Federal Aid Secondary Project No. 256 (1), to Virginia Bridge Co., Birmingham.
290 Tons, Carlton, Minn., state highway bridge 6546 to American Bridge Co., Pittsburgh.
240 Tons, Boston, garage, Metropolitan Transit Authority, through J. J. Powers, Cambridge, Mass., to A. O. Wilson Co., Cambridge, Mass.
225 Tons, Braintree, Mass., school, through Walsh Bros., Cambridge, Mass., to A. O. Wilson Co., Cambridge, Mass.
170 Tons, Red Wing, Minn., substation for the Public Fuel & Electric Co., to Bethlehem Steel Co., Inc., Bethlehem, Pa.
130 Tons, Chicago, Hebrew congregation building to Duffin Iron Works, Chicago.

• • • **Fabricated steel inquiries** this week included the following:

1000 Tons, Peoria, Ill., Junior high school building, project has been abandoned.
300 Tons, Chicago, bus terminal for Chicago Transit Authority. W. E. O'Neill Co. was low bidder. Entire project has been abandoned.
175 Tons, Racine Co., Wis., state highway bridge sections S084-i, and S055-i.
115 Tons, Memominee, Wis., state highway bridge section T06-4-2.

• • • **Reinforcing bar awards** this week included the following:

370 Tons, Urbana, Ill., staff building for University of Illinois, John Felmsley Co., previously reported low bidder has been awarded the contract.

• • • **Reinforcing bar inquiries** this week included the following:

1300 Tons, Springfield, Ill., colloseum for State of Illinois, all bids have been rejected.

Public Hearings Slated On Cement Case Results

Washington

• • • **Public hearings** by the Capehart special subcommittee into the impact of the Supreme Court Cement Decision upon the country's economy as a whole, will not get under way until November.

Staff organization and spadework for the investigation, however, has been started by the newly appointed general counsel, William Simon. Mr. Simon, a Chicago attorney, has had wide experience in Federal Trade Commission, Sherman Act, and Clayton Act cases.

Also, Dr. Melvin T. Copeland, loaned from Harvard University where he heads the business research staff, will form an advisory council and also begin work. The advisory group will be composed of 35 members from industry, government, agriculture and labor.

The advisory group will hold its first meeting on or about September 15.

Study of the effect of monopolies, concentration of industry, and relocation of business as a result of f.o.b. pricing will probably not be started until well after the first of next year. First studies by the council and the subcommittee will center upon various phases of freight absorption, phantom freight, etc.

"We want to know," Senator Capehart, R., of Ind., declares, "just which pricing policies are best for the country as a whole and if the court decision in the Cement Case will increase or decrease the price the consumer must pay for finished goods."

Alan Wood Prices

Conshohocken, Pa.

• • • **Alan Wood Steel Co.,** advanced prices effective with shipments made on July 26. Old prices are not included for comparison purposes because the company's return was affected by freight absorption on some items and by phantom freight on others. The new base prices, f.o.b. mill in cents per lb unless otherwise indicated, are:

Forging billets, net ton	$68.00
Rerolling billets, net ton	62.00
Plates	3.95
Floor plates	4.55
Hot-rolled sheets	5.00
Dynalloy sheets, 14 ga & lighter	5.25
Dynalloy plates	5.30

Kaiser-Frazer Earnings

Detroit

• • • **Consolidated earnings** of Kaiser-Frazer Corp. for the first six months of 1948 total $10,047,000 before income intaxes and $6,204,000 after taxes.

Cash balances on June 30, 1948 totaled $28,900,000 and net working capital increased during the quarter by $2,838,233.

Sales volume for the second quarter of 1948 was $92,700,000 compared with $52,958,000 during the same period a year ago.

American Scientists Give Papers Abroad

Bayside, N. Y.

• • • **Dr. Henry H. Hausner** and Walter E. Kingston of the Sylvania Electric Products, Inc. metallurgical research laboratories flew to Graz, Austria, to deliver 2 scientific papers on powder metallurgy at the First International Metal Powders Congress held there from July 12 to 17.

Dr. Henry H. Hausner

First International Metal Powders Congress presented the findings of world famous scientists active in pure science and theoretical physics applied to powdered metals.

Kingston's paper on "The Mechanism of Sintering Metal Powder Compacts" was one of 10 papers reporting the latest scientific theories of the sintering process.

Dr. Hausner's paper, "The Electrical Conductivity of Sintered Materials", was one of 12 in a group describing the physical properties of sintered metal bodies.

STEEL COMPANY EARNINGS—1948 AND 1947

Company	Second Quarter '48	Second Quarter '47	First Half '48	First Half '47
U. S. Steel	$32,585,677	$29,336,868	$66,543,018	$68,571,379
Bethlehem Steel	15,099,775	32,408,866	30,599,106	48,499,392
National Steel	7,364,275	5,775,757	16,026,035	13,100,815
Jones & Laughlin	6,341,197	5,366,124	11,491,901	11,703,256
Youngstown Sheet & Tube	5,609,764	4,293,389	10,760,468	10,630,520
Inland Steel	6,549,849	6,125,431	15,008,393	14,121,288
Armco Steel	6,157,055	6,312,104	12,024,402	12,230,981
Wheeling Steel	3,043,475	2,841,804	5,824,732	5,790,072
Acme Steel	....	....	3,442,000	4,136,850
Allegheny Ludlum	1,624,344	1,688,031	2,931,815	3,517,640
Crucible Steel	633,757	376,214	1,201,543	1,268,024
Superior Steel	....	....	551,850	659,351

MACHINE TOOLS

. . . News and Market Activities

More Delay Seen in Placing of Machine Tool Orders Under ECA

• • • **Additional delay** in placing orders for a reported $122 million in machine tools for Europe under ECA seemed likely this week as a serious hitch, the apparent inability of ECA countries to divide credits among the various capital goods categories, developed in ECA's plans for the speedy funneling of capital goods to Europe.

Reliable sources in the machine tool industry hinted that the desire on the part of ECA countries to build up their own manufacturing industries, particularly in the capital goods field, was in part responsible for the delay.

Some observers still hold out the hope that the ECA orders will reach the industry here sometime in September, but second guessers allege that it will be closer to December or 1949 before this business comes through.

On the other hand, ECA has not yet found, or at least appointed, a man to handle the capital goods organization, which also suggests that the fourth quarter is a safe bet for the first orders.

From an industry point of view, the rearmament program is looking more like a chronological parallel to ECA every minute. The program is moving very slowly and while the industry is being offered invitations to bid on machine tools, there are a number of stipulations in the specifications which are not easy for many machine tool companies to accept. According to industry sources, there is not only the renegotiation clause, but another little gimmick that allows the government a non-exclusive license to have the machine built.

Lethargy is also characterizing another development of considerable importance to several companies in the industry, the blocked orders. Latest reports have it that ECA through the general accounting offices, is trying to get out of buying the machines. The machine tool companies involved have not been paid, although only licenses for Hungary have been refused.

By and large, the sales trend is almost horizontal. Shipments were pretty good in June (about $28 million; new orders $24 million) and are probably somewhat indicative of efforts to clean up the assembly floors before the vacation periods. Foreign business in some segments of the industry is off to a reported 10 pct of total volume compared with 20 to 30 pct normally.

Rearmament Orders Moving In Low Gear, Due Partly To Contract Clauses

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In Detroit, informed machine tool sources indicate that August volume is likely to be unusually slow, following a mediocre July. Builders of special machines are reported to be actively soliciting business from all potential buyers. No major automobile producer is presently engaged in a substantial tooling program, it is reliably reported, and the possibilities that orders will be placed in the near future appears at the moment to be remote.

The lack of vitality in the present market is indicated by the faint response which preceded the recent price boosts. According to informed suppliers here, only a scattering of orders were placed by buyers who wanted to get under the wire at the lower price levels.

Perhaps the slowest segment of the market today is the special machine tool classification. Lay-offs have been necessary in several plants. In addition, prices being quoted have been boosted fantastically in some quarters, according to machine tool buyers. Another factor tending toward caution in this market is the growing realization that a breakdown in a very large installation on which a plant wholly depends may actually be serious enough to close down the entire operation. For this reason, tool designers seem to be looking for opportunities to build more flexibility into their transfer-type equipment.

Some producers continue to report a sizeable volume of foreign business, but this market has been contracting steadily as the iron curtain has advanced. Few machine tool builders here are relying at present on any future expansion in foreign orders, assuming the status quo continues.

In Sidney, Ohio, Monarch Machine Tool Co., on net sales of $2,082,289, has reported net profit for the second quarter of 1948 of $146,953 or 70¢ a share. Jerome A. Raterman, Monarch president, said ratio of net earnings to net sales rose from 6.43 pct in the first quarter to 7.06 pct in the June quarter. Net profit for six months totaled $264,100 or $1.21 a share on sales of $3,748,244. Net profit in the second quarter of 1947 was $160,357 and for six months $354,678. Sales were $2,146,2447 and $4,464,293.

Monarch has also announced a new lathe, the Shapemaster engraver, which will turn shapes and designs heretofore produced only by hand engraving. According to Monarch engineers, this is the only type of engraving machine which can form an inside sharp corner. Fields of application include the glass, plastics and mechanical rubber industries where special mold shapes are required.

Detroit's Tool and Die Workers Sign Contract

Detroit

• • • **Settlement of the** 5-week old strike by approximately 5000 Detroit tool and die makers in 75 shops has been reached. Under the terms of a 2-year agreement dated July 17, 1948 members of UAW-CIO Locals 157 and 158 will receive an increase of 15 cents per hr plus a liberalization in computing vacation pay which has been estimated to cost an additional cent. Vacation allowances will be computed on a basis of a percentage of the employees yearly gross earnings.

The union had been asking for a 20 cent pay boost.

$2.50 Rise Accepted; Cast Grades Stronger

New York

• • • **The $2.50 a ton** price above the old formula has now been accepted in all major markets. Large buyers came into the market early last week to sew it up. They assert that this is positively the price. And also add that they don't intend to break it for some time.

Shipments immediately picked up in some areas, with the end of hesitation on openhearth grades. This is not seen as a particularly encouraging sign. Shipments had dropped off with rumors that steel prices were going up and a lot of what is now moving on the open market is merely material that had been speculatively held.

Cast iron scrap was $1 stronger in Pittsburgh and heavy breakable cast moved up $3 there. New York cast buying prices were also $2 better. Malleable hit a new high in Chicago where sales were made at more than $80.

Material is still reported as being held back because some isolated segments of the trade do not appear to be happy with the $2.50 boost. At the same time railroads seem to be reluctant to sell heavy melting steel at the new prices. They had hoped for higher prices, particularly since some sources are being offered more than the current prices.

Generally, dealers view the market with a confused attitude. They don't know what to expect. Some see the $2.50 price increase as a move to cover over-the-market prices that were being payed to get scrap. They are assuming much the wait-and-see attitude. But one thing remains clear—it is not probable that higher prices will uncover any additional scrap.

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PITTSBURGH—Turnings and all steelmaking grades have taken the $2.50 increase. Last week there was a slight hesitation in these grades before they moved up. But this week the new formula is being applied clear across the board. Cast grades have reflected the increase with No. 1 cupola moving up $1 and heavy breakable as much as $3. Railroad specialties are up $1.50. Low phos, which was attracting a premium before the formula advance and actually set the pace for the move, held its price last week. But it moved up a dollar to $49 to $50 this week. Movement is still fairly good on the new price as speculative buyers have released this material, but many observers would not be surprised if the new formula is tested before too long.

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CHICAGO—All mills have now placed orders at the new price. Shipments immediately picked up although higher prices do not generate any more scrap. They certainly caused more to be shipped. The new orders placed were not too large. During last year's bull market, Carnegie placed 100,000 tons at the high price then in effect. This time Carnegie placed much less tonnage. Railroad lists closed stronger on all items. Maleable hit an all time high last week with sales made above $80. Earmarked scrap was also raised $2.50 by the mills and the old unfilled orders were moved up to the new price.

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PHILADELPHIA—The market here is quiet. No price changes were made this week. But a strong undertone prevails as a result of the $2.50 increase in this market. Most dealers are confused. They don't know what to expect. Some feel that prices may go still higher. Consensus of opinion here is that the price increase here was a result of over-the-market prices that had recently been upsetting the market. Despite higher prices, no additional tonnage has appeared on the market. The same strong demand continues to exist.

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CLEVELAND—Despite the increase in scrap prices last week, major consumers here and in the Valley report that shipments have shown no market improvement and are still not good. Rumor has it that the trade was expecting a $5 increase, but probably the real reason for the poor shipments is the fact that the scrap just isn't available. Quality is poor. There is some reluctance on the part of brokers to take a long order. I seems likely that the $2.50 increase will bring out what scrap is in yards and producers' plants. But the future is anything but rosy. All grades are in strong demand and foundries are showing a willingness to pay more money.

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DETROIT—Scrap prices here are holding, temporarily at least, at the new formula which is $2.50 over the previous level for openhearth grades. According to most sources, scrap volume is in line with available supply. Any indications that the new price line will not be held are not yet evident. The price of cast grades firmed up this week with the reopening of Detroit's tool and die shops but buying is still spotty. Numerous complaints about grading in this classification continue to be heard.

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BUFFALO—Moderate buying of steel furnace grades by leading consumers made the $2.50 increase in this market official last week. Although old orders at $39.75 remained on the books. Most of the latter were believed to be reciprocal transactions. Because consumers of borings and turnings refused to follow the market, opinion was sharply divided on prices. Resulting in a $2.50 spread. No. 1 heavy melting climbed another dollar on the outside level, ranging from $45.00 to $47.00. Activity in low phos plate was negligible and the market was nominal at $47.25 to $48. Electrical furnace and foundry consumers were holding off to give the market a chance to quiet down.

BIRMINGHAM—Scrap situation in this area generally remains the same, with demand strong for steel scrap. Cast grades of scrap are moving more slowly. The general $2.50 price advance announced here last week for open hearth apparently has stimulated market for steel scrap. Rerolling rails are in particular demand, with supply short.

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NEW YORK—No. 1 heavy melting steel was quotable this week at $38.50 though some small purchases at $39 have been reported. No. 2 steel was steady at $37. Activity in New England has given cast prices a shot in the arm. No. 1 cast and clean auto cast were being bought at $57.50 to $58.50, up $2. General summer listlessness prevailed, with activity at a low level. Large consumers of clean chemical cast borings have heavy inventories and are now out of the market.

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CINCINNATI—Limited tonnages of all grades are moving at the new formula prices. But material is still being held back because some isolated segments of the trade are not happy with a $2.50 boost. At the same time, some railroads are reluctant to sell heavy melting steel at the new prices, having hoped for something more, particularly when higher prices are being offered. Foundry grades are strong and moving, despite vacations in consuming plants and shutdowns in the automobile industry. All this has brokers looking for a higher market.

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BOSTON—For the first time in about a year, formula prices have moved up from $31.65 to $31.90, to a new figure of $34.40. But even with this upward adjustment, which of course was expected, there is still a question whether brokers are paying more than the formula. The demand continues strong. Chemical borings are still a drug on the market and are quoted at a low price of $33.00 to $33.50. There is no change in cast, though it is still on the firm side.

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ST. LOUIS—Reaction to the $2.50 a ton increase in the price of heavy melting steel by the mills in the St. Louis industrial district was a slowing down of receipts. Holders of scrap are holding on to it in the hope of another increase this summer. Heat has also tended to hold back the movement. Locomotive tires and rails are higher on heavier demand and lighter supply. Wabash has a list of approximately 1000 tons.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.50 to	$43.00
RR. hvy. melting	43.50 to	44.00
No. 2 hvy. melting	42.50 to	43.00
RR. scrap rails	56.00 to	57.00
Rails 2 ft and under	62.50 to	63.50
No. 1 comp'd bundles	42.50 to	43.00
Hand bdld. new shts.	42.50 to	43.00
Hvy. axle turn.	44.00 to	44.50
Hvy. steel forge turn	44.00 to	44.50
Mach. shop turn	38.00 to	38.50
Shoveling turn.	40.50 to	41.00
Mixed bor. and turn	38.00 to	38.50
Cast iron boring	40.50 to	41.00
No. 1 cupola cast	64.50 to	65.50
Hvy. breakable cast	55.00 to	56.00
Malleable	76.00 to	77.00
RR. knuck, and cup	57.50 to	58.50
RR. coil springs	57.50 to	58.50
RR. leaf springs	57.50 to	58.50
Rolled steel wheels	57.50 to	58.50
Low phos.	49.00 to	49.50

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy, melting	$41.50 to	$42.00
No. 2 hvy. melting	41.50 to	42.00
No. 1 bundles	41.50 to	42.00
No. 2 dealers' bundles	41.50 to	42.00
Bundled mach. shop turn.	39.50 to	40.00
Galv. bundles	38.00 to	38.50
Mach. shop turn.	36.50 to	37.00
Short shov. turn.	38.50 to	39.00
Cast iron borings	38.00 to	39.00
Mix. borings & turn	36.50 to	37.00
Low phos. hvy, forge	50.00 to	52.00
Low phos. plates	48.00 to	49.00
No. 1 RR. hvy. melt	47.00 to	48.00
Rerolling rails	63.00 to	65.00
Miscellaneous rails	60.00 to	61.00
Angles & splice bars	59.00 to	60.00
Locomotive tires, cut	58.00 to	59.00
Cut bolster & side frames	54.00 to	55.00
Standard stl. car axles	69.00 to	70.00
No. 3 steel wheels	56.00 to	57.00
Couplers & knuckles	56.00 to	57.00
Rails, 2 ft and under	64.00 to	65.00
Malleable	80.00 to	82.00
No. 1 mach. cast	73.00 to	75.00
No. 1 agricul. cast	68.00 to	69.00
Heavy breakable cast	61.00 to	65.00
RR. grate bars	67.00 to	68.00
Cast iron brake shoes	59.00 to	60.00
Cast iron car wheels	62.00 to	63.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.00 to	$42.00
No. 2 hvy. melting	41.00 to	42.00
No. 1 bundles	41.00 to	42.00
No. 2 bundles	41.00 to	42.00
Mach. shop turn	35.50 to	36.00
Shoveling turn.	37.50 to	38.00
Cast iron borings	35.00 to	35.50
Mixed bor. & turn	35.00 to	35.50
Low phos., plate	48.50 to	50.50
No. 1 cupola cast	66.00 to	68.00
Hvy. breakable cast	58.00 to	59.00
Rails 18 in. & under	61.50 to	62.50
Rails random length	55.00 to	56.00
Drop broken	70.00 to	71.00

BOSTON

Dealers' buying prices, per gross ton, f.o.b. Boston

No. 1 heavy, melting		$34.40
No. 2 hvy, melting		34.40
Nos. 1 and 2 bundles		34.40
Busheling		34.40
Shoveling turn.		32.40
Machine shop turn.		30.40
Mixed bor. & turn		30.40
Cl'n cast chem. bor	33.00 to	34.50
No. 1 machinery cast	59.00 to	60.00
No. 2 machinery cast	56.00 to	57.00
Heavy breakable cast	54.00 to	54.50
Stove plate	51.00 to	51.50

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	....	$38.00
No. 2 hvy. melting	....	38.00
No. 1 bundles	....	38.00
New busheling	....	38.00
Flashings	....	38.00
Mach. shop turn.	$32.50 to	33.00
Shoveling turn.	34.50 to	35.00
Cast iron borings	33.50 to	34.00
Mixed bor. & turn	34.50 to	35.00
Low phos. plate	42.50 to	43.00
No. 1 cupola cast	55.00 to	58.00
Heavy breakable cast	50.00 to	53.00
Stove plate	52.00 to	53.00
Automotive cast	55.00 to	58.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$44.50 to	$45.50
No. 2 hvy. melting	41.00 to	41.50
No. 1 bundles	44.50 to	45.50
No. 2 bundles	41.00 to	41.50
Mach. shop turn.	36.50 to	37.50
Shoveling turn.	36.50 to	37.00
Mixed bor. & turn	36.50 to	37.00
Clean cast chemical bor	42.00 to	44.00
No. 1 machinery cast	65.00 to	66.00
No. 1 mixed yard cast	60.00 to	62.00
Hvy. breakable cast	63.00 to	64.00
Clean auto cast	65.00 to	66.00
Hvy. axle forge turn	46.50 to	47.50
Low phos. plate	49.00 to	50.00
Low phos. punchings	50.50 to	51.50
Low phos. bundles	48.50 to	49.50
RR. steel wheels	52.00 to	53.00
RR. coil springs	52.00 to	53.00
RR. malleable	75.00 to	78.00
Cast iron carwheels	68.00 to	70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.00 to	$43.00
No. 2 hvy. melting	40.00 to	41.00
Bundled sheets	40.00 to	41.00
Mach. shop turn.	35.00 to	36.00
Locomotive tires, uncut	50.00 to	51.00
Mis. std. sec. rails	52.00 to	54.00
Steel angle bars	54.00 to	55.00
Rails 3 ft and under	58.00 to	60.00
RR. steel springs	51.00 to	52.00
Steel car axles	56.00 to	57.00
Grate bars	59.00 to	60.00
Brake shoes	57.00 to	58.00
Malleable	72.00 to	73.00
Cast iron car wheels	61.00 to	62.00
No. 1 machinery cast	65.00 to	67.00
Hvy. breakable cast	59.00 to	60.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	....	$40.00
No. 2 hvy. melting	....	40.00
No. 2 bundles	....	40.00
No. 1 busheling	....	40.00
Long turnings	27.50 to	28.50
Shoveling turnings	29.50 to	30.50
Cast iron borings	....	....
Bar crops and plate	44.00 to	45.00
Structural and plate	44.00 to	45.00
No. 1 cupola cast.	64.00 to	67.00
Stove plate	63.00 to	64.00
No. 1 RR. hvy, melt	....	41.00
Steel axles	51.00 to	52.00
Scrap rails	44.00 to	45.00
Rerolling rails	51.00 to	53.00
Angles & splice bars	51.00 to	53.00
Rails 3 ft & under	52.00 to	55.00
Cast iron carwheels	50.00 to	55.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.50 to	$43.00
No. 2 hvy. melting	42.50 to	43.00
Mach. shop turn.	37.50 to	38.00
Short shov. turn.	39.50 to	40.00
Cast iron borings	38.50 to	39.00
Low phos.	47.50 to	48.00

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting		$38.50
No. 2 hvy. melting	....	37.00
No. 2 bundles	....	37.00
Mach. shop turn.	31.50 to	32.00
Mixed bor .& turn.	31.50 to	32.00
Shoveling turn.	33.50 to	34.50
Shoveling turn.	33.50 to	34.00
No. 1 cupola cast	57.50 to	58.50
Clean auto cast	57.50 to	58.50
Hvy. breakable cast	56.00 to	57.50
Charging box cast	56.00 to	57.50
Unstrp motor blks	53.50 to	54.00
Cl'n cast chem. bor	34.50 to	35.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$45.00 to	47.0
No. 2 heavy. melting	39.75 to	42.2
No. 1 bundles	39.75 to	42.2
No. 2 bundles	39.75 to	42.2
No. 1 busheling	39.75 to	42.2
Mach. shop turn.	34.75 to	37.7
Shoveling turn.	36.75 to	39.2
Cast iron borings	35.75 to	38.2
Mixed bor. & turn	34.75 to	37.7
No. 1 cupola cast	64.00 to	65.0
Mixed cupola cast	60.00 to	61.0
Charging box cast	56.00 to	57.0
Stove plate	60.00 to	61.0
Stove auto cast	60.00 to	61.0
RR. malleable	70.00 to	75.0
Small indl. malleable	47.00 to	49.0
Low phos, plate	47.25 to	48.0
Scrap rails	50.00 to	52.0
Rails 3 ft & under	57.00 to	58.0
RR steel wheels	51.00 to	52.0
Cast iron carwheels	51.00 to	52.0
RR. coil & leaf spgs	51.00 to	52.0
RR. knuckles & coup	51.00 to	52.0

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$42.00 to	$42.5
No. 2 hvy. melting	42.00 to	42.5
No. 1 bundles	42.00 to	42.5
No. 1 busheling	42.00 to	42.5
Drop forge flashings	42.00 to	42.5
Mach. shop turn.	37.00 to	37.5
Shoveling turn.	38.00 to	38.5
Steel axle turn	42.00 to	42.5
Cast iron borings	38.00 to	38.5
Mixed bor. & turn	38.00 to	38.5
Low phos.	47.00 to	47.5
No. 1 machinery cast	73.00 to	76.00
Malleable	74.00 to	76.00
RR. cast.	73.00 to	74.00
Railroad grate bars	60.00 to	62.00
Stove plate	61.00 to	63.00
RR. hvy. melting	42.50 to	43.00
Rails 3 ft & under	60.00 to	61.00
Rails 18 in. & under	62.00 to	63.00

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy, melting	....	$27.50
No. 2 hvy, melting	....	27.50
No. 2 bales	..	27.50
No. 3 bales	....	24.50
Mach. shop turn.	....	18.00
Elec. fur. 1 ft under	36.00 to	40.00
No. 1 cupola cast	50.00 to	51.00
RR. hvy, melting	....	28.50
Rails	....	29.00

LOS ANGELES

Per gross ton f.o.b. shipping point:

No. 1 hvy, melting	...	$27.50
No. 2 hvy, melting	....	27.50
No. 1 bales	....	27.50
No. 2 bales	....	27.50
No. 3 bales	....	24.50
Mach. shop turn.	....	18.00
No. 1 cupola cast.	45.00 to	50.00
RR. hvy, melting	....	28.50

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	....	$26.00
Elec furn. 1 ft and under.	....	40.00
No. 1 cupola cast	40.00 to	43.50
RR. hvy, melting	....	26.00

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point.

Heavy melting		$22.00*
No. 1 bundles		22.00*
No. 2 bundles		21.50*
Mechanical bundles		20.00*
Mixed steel scrap		19.00*
Mixed borings and turnings		17.00*
Rails, remelting		23.00*
Rails, rerolling		26.00*
Bushelings		17.00*
Bushelings, new fact, prop'd		21.00*
Bushelings, new fact, unprep'd		16.00*
Short steel turnings		17.00*
No. 1 cast	$42.00 to	46.00
No. 2 cast	35.00 to	37.00

*Ceiling Price.

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

NONFERROUS METALS

. . . *News and Market Activities*

Sharp Increases In Lead and Zinc Prices Surprise Few In Trade

New York

• • • The biggest news in nonferrous circles is the price increases posted by producers of lead and zinc. Lead has been increased by 2¢ a pound, while the increase in zinc is 3¢ a pound. Few if any trade sources were surprised by the increases registered by these metals. All had been expecting the increases momentarily. And many had been predicting them for weeks.

The 2¢ a pound increase on lead now makes the price of this metal 19.30¢ at St. Louis and 19.50¢ at New York. The new quotation establishes another new record high for the metal. The last time the price of lead was raised was in April of this year. At that time the price was raised by 2.50¢ a pound to 17.50, which then was a record high for the metal. That quotation had been in effect until the current increase was announced on July 28. These are the only two changes in the price of lead this year. Last year there were three rapid fire increases, in January, February and March.

Reasons given for the increase were about the same as those given for the recent increase in steel prices. It was pointed out that the wage boost of 12¢ an hour immediately raised the cost of production. Higher costs of materials used by the mining and smelting industry were also cited in conjunction with the blame of increased costs. Higher freight rates also played their part.

In addition to the factor of increasing costs the supply of lead has been extremely tight for a long time. In fact it has been so tight that domestic consumers have in some cases been forced to buy foreign lead at prices that ranged up to 20¢ a pound. As a result prices on foreign concentrates had been forced up to the point where it was unprofitable for domestic refiners to import them and sell the finished product on the domestic market.

The strike at the St. Joseph Lead Co. in southeast Missouri has acted to aggravate the already short supply of the metal. Prior to the strike these mines had been producing about 10,000 tons per month. This amounts to almost a third of domestic production.

The 3¢ a pound increase in zinc makes the price 15¢ a pound, for East St. Louis prime western metal.

Monthly Average Prices

• • • The average prices of the major nnoferrous metals in July based on quotations appearing in THE IRON AGE, were as follows:

	Cents Per Pound
Electrolytic copper, Conn. Valley	21.50
Lake copper, Conn. Valley	21.625
Straits tin, New York	$1.03
Zinc, East St. Louis	12.444
Zinc, New York	13.094
Lead, St. Louis	17.596
Lead New York	17.796

Reasons given for the price boost were similar to those given for the increases in lead prices. The former zinc price of 12¢ a pound had been in effect since January, when slab zinc was moved up 1½¢ a pound from 10½¢.

Producers in the Tri-State area had been clamoring for a higher price for concentrate, as well as for refined zinc, ever since the removal of the subsidy on these metals. These high cost producers had repeatedly declared that without subsidies higher prices must prevail, if output was to be maintained.

As in the case of lead the demand for zinc has been in excess of supply for a long time. The action of the government in freezing the stocks that the Metals Reserve has been carrying prevented consumers from drawing on these stocks to supplement the current supply. Whether the higher price will act to bring more zinc onto the market remains to be seen, but many are inclined to doubt that it will to any appreciable extent.

Producers are hopeful that the sharp increases in the prices of lead and zinc will still expectations of further advances in the prices of the metals. They hope, too, that the increase will act to release scrap which they maintain has been held back for some time in anticipation of higher prices.

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Lead, Zinc Scrap Up Too

New York

• • • The price increases registered in virgin lead and zinc acted to raise the prices of scrap in these same metals. However the increases in lead and zinc scrap were not proportionate to the increases in the virgin metals. The chief reason for this is that the new metals prices had been anticipated for some time and the scrap prices had been advancing ahead of the increase.

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Cites Aluminum Shortage

New York

• • • Although the aluminum industry is currently producing at a rate of 1.3 billion lb a year, or about 4 times the prewar average, we are running at least 500 million pounds short of this year's civilian demand, according to Donald M. White, secretary of the Aluminum Assn. Mr. White declared that the aluminum industry is now too small for civilian and military needs because of a lack of low cost electrical power.

"Both the threat of inflation here at home and the threat of war from abroad call for as rapid an increase in the production of aluminum as possible," Mr. White asserted.

Nonferrous Metals Prices

	July 28	July 29	July 30	July 31	Aug. 2	Aug. 3
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	$1.03	$1.03	$1.03	$1.03	$1.03	$1.03
Zinc, East St. Louis	15.00	15.00	15.00	15.00	15.00	15.00
Lead, St. Louis	19.30	19.30	19.30	19.30	19.30	19.30

Primary Metals

(Cents per lb. unless otherwise noted)

Aluminum, 99+%, 10,000 lb, f.o.b. shipping point, freight allowed	**16.00**
Aluminum pig, f.o.b. shipping point	15.00
Antimony, American, Laredo, Tex.	35.00
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	**$20.50**
Beryllium aluminum 5% Be, dollars per lb contained Be	**$40.00**
Cadmium, del'd	**$1.75**
Cobalt, 97-99% (per lb)	**$1.65 to $1.72**
Copper electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	**21.625**
Gold, U. S. Treas., dollars per oz.	**$35.00**
Indium. 99.8%, dollars per troy oz.	**$2.25**
Iridium, dollars per try oz	$110 to $120
Lead. St. Louis	19.30
Lead, New York	19.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	**20.50**
Magnesium, sticks, carlots	**34.50**
Mercury, dollars per 76-lb flask, f.o.b. New York	**$76 to $78**
Nickel, electro, f.o.b. New York	42.90
Palladium, dollars per troy oz	**$24.00**
Platinum, dollars per troy oz	$93 to $96
Silver, New York, cents per oz	**74.625**
Tin, Grade A, New York	**$1.03**
Zinc, East St. Louis	15.00
Zinc, New York	15.65
Zirconium copper, 20 pct Zr, per lb contained Zr.	**$8.75**

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	**19.50–20.00**
No. 120	**19.00–19.50**
No. 123	**18.50–19.00**
80-10-10 ingot	
No. 305	**25.25**
No. 315	**22.25**
88-10-2 ingot	
No. 210	**31.00**
No. 215	**29.00**
No. 245	**23.25–23.75**
Yellow ingot	
No. 405	**15.25–16.00**
Manganese bronze	
No. 421	**19.00**

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	26.50–27.50
0.60 copper, max.	26.50–27.00
Piston alloys (No. 122 type)	24.25–24.75
No. 12 alum. (No. 2 grade)	23.50–24.00
108 alloy	23.50–24.25
195 alloy	23.50–24.50
13 alloy	26.00–27.00
AXS-679	24.00–24.50

Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95 pct.-95½ pct.	24.50–25.50
Grade 2—92 pct–95 pct.	24.00–25.00
Grade 3—90 pct–92 pct.	23.00–24.00
Grade 4—85 pct–90 pct.	23.50–24.00

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37⅝
Electrodeposited	32⅜
Rolled, oval, straight, delivered	**34.34**
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	33⅜
Zinc, cast, 99.99	20.50
Nickel 99 pct plus, frt. allowed	
Cast	—
Rolled, depolarized	—
Silver 999 fine	
Rolled, 100 oz lots per troy oz.	**67¼**

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	**44.00**
Copper sulfate, 99.5, crystals, bbls.	**12.50**
Nickel salts, single or double, 425 lb bbls. frt. allowed	——
Nickel chloride, 300 lb bbl.	——
Silver cyanide, 100 oz. lots, per oz.	**54.00**
Sodium cyanide, 96 pct domestic, 100 lb drums	**15.00**
Zinc cyanide, 100 lb drums	**35.00**
Zinc sulfate, 89 pct, granules, bbls, frt. allowed	**7.90**

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb., f.o.b. shipping point, freight allowed.)

Flat Sheet: 0.188 in., 2S, 3S, 25.7¢; 4S, 61S-O, 27.8¢; 52S, 29.9¢; 24S-O, 24S-OAL, 28.8¢; 75S-O, 75S-OAL, 35.3¢. 0.081 in., 2S, 3S, 26.8¢; 4S, 61S-O, 29.2¢; 52S, 31.3¢; 24S-O, 24S-OAL, 29.9¢; 75S-O, 75S-OAL, 37.0¢. 0.032 in., 2S, 3S, 28.5¢; 4S, 61S-O, 32.5¢; 52S, 35.2¢; 24S-O, 24S-OAL, 36.9¢; 75S-O, 75S-OAL, 46.6¢.

Plate: ¼ in. and heavier; 2S, 3S, 22.8¢; 4S-F, 25.0¢; 52S, 26.1¢; 61S-O, 25.6¢; 24S-F, 24S-FAL, 26.1¢; 75S, 75S-AL, 32.9¢.

Extruded Solid Shapes: Shape factors 1 to 4; 31¢ to 59¢; 11 to 13, 31.9¢ to 69c; 23 to 25, 33.4c to 90¢; 35 to 37, 40.8¢ to $1.25; 47 to 49, 58.7¢ to $1.84.

Extruded Round Rod, Square, Hex, Octagonal Bar: ¼ in. and over, 27¢ to 38¢; ½ to ¾ in., 28¢ to 40.5¢; ⅜ to ½ in., 29c to 43c; ¼ to ⅜ in., 30¢ to 46.5¢; 3/16 to 7/32 in., 32.5¢ to 53.5¢; 9/64 to 5/32 in., 35.5¢ to 62¢.

Rolled Rod: 1.064 to 4.5 in., 2S, 3S, 33¢ to 29.5¢; Cold-finished rod, 0.375 to 3.5 in., 2S, 3S, 35.5¢ to 31¢.

Screw Machine Stock: Drawn, ⅛ to 11/32 in., 11S-T3, R317-T4, 48¢ to 34¢; cold-finished, ⅜ to 1½ in., 11S-T3, 37.5¢ to 34.5¢; ⅜ to 2 in., R317-T4, 33¢ to 30¢; rolled, 1 3/16 to 3 in., 11S-T3, 34.5¢ to 31.5¢; 2⅛ to 3⅜ in., R317-T4, 29.5¢ to 28.5¢. Base 5000 lb.

Drawn Wire: coiled, 0.051 to 0.374 in.; 2S, 35¢ to 25.5¢; 52S, 43c to 31c; 56S, 45.5c to 37¢; 17S-T4, 49¢ to 33.5¢; 61S-T4, 43.5c to 33c.; 75S-T6, 75¢ to 54¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58c-60c; 10, 59c-61c; 12, 63-65c; 14, 69c-74c; 16, 76c-81c; 18, 84c-89c 20, 96c-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher.

Extruded Round Rod: M, diam. in., ¼ to 0.311, 58¢; ½ to ¾, 46¢; 1¼ to 1.749, 43¢; 2½ to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., ¼ to 0.311, 61¢; ½ to 0.749, 48¢ 1¼ to 1.749, 44¢; 2½ to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb. per ft, per. up to 3.5 in., 55¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 51¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 47¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 44¢; 4 to 6 lb per ft, per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 5/16 $1.14; 5/16 to ⅜, $1.02; ½ to ⅝, 76¢; 1 to 2 in., 65¢. 0.065 to 0.082, ⅜ to 7/16, 85¢; ⅝ to ¾, 62¢; 1 to 2 in., 57¢. 0.165 to 0.219, ⅝ to ¾, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	50
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks		40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	34.78	....	35.18
Copper, hot-rolled	....	31.28	....
Copper, drawn	....	32.28	....
Low brass	35.86*	32.64	32.95
Yellow brass	34.42*	31.10	31.41
Red brass	36.39*	33.17	33.48
Naval brass	31.53	30.28	36.22
Leaded brass	29.89	25.94	....
Commercial bronze	37.18*	34.21	34.52
Manganese bronze	35.12	33.62	39.72
Phosphor bronze, 5 pct	55.90*	54.40	54.15
Muntz metal	31.05	29.80	34.24
Everdur, Herculoy, Olympic, etc.	....	38.75	39.81
Nickel silver, 10 pct	....	43.68	41.54
Architectural bronze	29.89	....	....

*Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1¢ per lb for shipments of 15,000 lb or more.)

	Heavy	Turnings
Copper	19⅛	18⅝
Yellow brass	15⅝	14¾
Red brass	17½	16¾
Commercial bronze	17⅝	16⅞
Manganese bronze	15¼	14⅜
Leaded brass rod ends	15⅜	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery.)

No. 1 copper wire	18.75–19.00
No. 2 copper wire	17.75–18.00
Light copper	16.75–17.00
Refinery brass	17.00*

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer.)

No. 1 copper, wire	**18.50**
No. 2 copper, wire	**17.50**
Light copper	**16.50**
No. 1 composition	15.50
No. 1 comp. turnings	15.00
Rolled brass	11.75
Brass pipe	12.00
Radiators	12.75
Heavy yellow brass	11.00

Aluminum

Mixed old cast	11.50
Mixed old clips	11.50
Mixed turnings, dry	**11.00**
Pots & pans	**12.00**
Low copper	**12.50**

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass

No. 1 heavy copper and wire	17 —17¼
No. 2 heavy copper and wire	16 —16¼
Light copper	15 —15¼
Auto radiators (unsweated)	10½—11
No. 1 composition	13¼—13½
No. 1 composition turnings	12¾—13
Clean red car boxes	9¾—10
Cocks and faucets	9¾—10¼
Mixed heavy yellow brass	8¼— 8¾
Old rolled brass	9¾—10
Brass pipe	10¼—10½
New soft brass clippings	13 —13½
Brass rod ends	10½—11
No. 1 brass rod turnings	9¾—10¼

Aluminum

Alum. pistons and struts	8½— 9
Aluminum crankcases	11 —11½
2S aluminum clippings	12½—13
Old sheet & utensils	11 —11½
Dry borings and turnings	5½— 6
Misc. cast aluminum	11 —11½
Dural clips (24S)	11 —11½

Zinc

New zinc clippings	9 — 9½
Old zinc	7 — 7½
Zinc routings	4 — 4½
Old die cast scrap	4½— 5

Nickel and Monel

Pure nickel clippings	17 —18
Clean nickel turnings	13 —14
Nickel anodes	17 —18
Nickel rod ends	17 —18
New Monel clippings	12 —13
Clean Monel turnings	8 — 9
Old sheet Monel	10 —10½
Old Monel castings	7½— 8
Inconel clippings	9 —10
Nickel silver clippings, mixed.	8 — 8½
Nickel silver turnings, mixed.	6½— 7

Lead

Soft scrap lead	16½—17
Battery plates (dry)	10½—11

Magnesium Alloys

Segregated solids	8 — 9
Castings	4½— 5½

Miscellaneous

Block tin	81 —83
No. 1 pewter	65 —67
No. 1 auto babbitt	50 —52
Mixed common babbitt	14¼—14¾
Solder joints	19½—20
Siphon tops	50 —52
Small foundry type	20 —20½
Monotype	19 —19½
Lino. and stereotype	18 —18½
Electrotype	16½—17
New type shell cuttings	15 —15½
Hand picked type shells	6½— 7
Lino and stereo dross	9½—10
Electro dross	6½— 7

Comparison of Prices . .

Price advances over previous week are printed in Heavy Type; declines appear in *Italics.*

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel: (cents per pound)	Aug. 3, 1948	July 27, 1948	July 6, 1948	Aug. 5, 1947
Hot-rolled sheets	3.26	3.26	2.775	2.80
Cold-rolled sheets	4.00	4.00	3.495	3.55
Galvanized sheets (10 ga)	4.40	4.40	3.913	3.95
Hot-rolled strip	3.265	3.265	2.775	2.80
Cold-rolled strip	4.00	4.00	3.535	3.55
Plates	3.425	3.425	2.93	2.95
Plates wrought iron	7.85	7.25	7.25	6.85
Stain's C-R strip (No.302)	30.50	30.50	30.50	30.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes	$6.80	$6.80	$6.70	$5.75
Tinplate, electro (0.50 lb)	6.00	6.00	5.90	5.05
Special coated mfg. ternes	5.90	5.90	5.80	4.94
Bars and Shapes: (cents per pound)				
Merchant bars	*3.37*	3.375	2.875	2.90
Cold-finished bars	3.995	3.994	3.483	3.55
Alloy bars	3.75	3.75	3.213	3.30
Structural shapes	3.25	3.25	2.767	2.80
Stainless bars (No. 302)	26.00	26.00	26.00	26.00
Wrought iron bars	9.5	8.65	8.65	7.15
Wire: (cents per pound)				
Bright wire	4.344	4.344	3.608	3.55
Rails: (dollars per 100 lb)				
Heavy rails	*$3.20*	$3.217	$2.725	$2.75
Light rails	*3.55*	3.575	3.05	3.10
Semifinished Steel: (dollars per net ton)				
Rerolling billets	$52.00	$52.00	$45.00†	$45.00†
Slabs, rerolling	52.00	52.00	45.00†	45.00†
Forging billets	61.00	61.00	54.00†	55.00†
Alloy blooms, billets, slabs	63.00	63.00	66.00	66.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	3.619	3.619	3.133	2.80
Skelp	3.25	3.25	2.888	2.60

† Gross ton

Pig Iron: (per gross ton)	Aug. 3, 1948	July 27, 1948	July 6, 1948	Aug. 1947
No. 2, foundry, Phila.	$46.76	$46.76	$44.74	$40.39
No. 2, Valley furnace	43.50	43.50	39.50	36.50
No. 2, Southern Cinti.	48.14	48.14	45.47	38.25
No. 2, Birmingham	43.38	43.38*	39.38	33.38
No. 2, foundry, Chicago†	43.00	43.00	39.00	36.00
Basic del'd Philadelphia	46.25	46.25	44.24	39.89
Basic, Valley furnace	43.00	43.00	39.00	36.00
Malleable, Chicago†	43.50	43.50	39.50	36.50
Malleable, Valley	43.50	43.50	39.50	36.50
Charcoal, Chicago	65.55	65.55	65.55	48.49
Ferromanganese‡	145.00	145.00	145.00	135.00

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡ For carlots at seaboard.
* Revised.

Scrap: (per gross ton)	Aug. 3, 1948	July 27, 1948	July 6, 1948	Aug. 1947
Heavy melt'g steel, P'gh.	$42.75	$42.75	$40.25	$41.75
Heavy mlt'g steel, Phila.	45.00	45.00	42.50	40.50
Heavy melt'g steel, Ch'go	41.75	41.75	40.00	40.25
No. 1, hy, comp, sh't, Det.	38.00	38.00	35.50	37.50
Low phos. Young'n	47.75	47.75	45.25	46.50
No. 1, cast, Pittsburgh	**65.00**	63.75	63.75	39.75
No. 1, cast, Philadelphia	65.50	65.50	67.00	48.50
No. 1, cast, Chicago	**74.00**	73.00	70.00	47.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke prompt	*$13.50*	$13.75	$13.50	$12.00
Foundry coke, prompt	17.00	16.50	16.50	13.75
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro. Conn.	21.50	21.50	21.50	21.50
Copper, Lake Conn.	21.625	21.625	21.625	21.62
Tin, Grade A, New York	$1.03	$1.03	$1.03	80.00
Zinc, East St. Louis	**15.00**	12.00	12.00	10.50
Lead, St. Louis	**19.30**	17.30	17.30	14.80
Aluminum, virgin	16.00	16.00	16.00	15.00
Nickel, electrolytic	42.90	42.81	36.56	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	35.00	35.00	35.00	33.00

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL (Base Price)	PIG IRON	SCRAP STEEL
Aug. 3, 1948	*3.76859¢* per lb.	$43.94 per gross ton	$43.16 per gross ton
One week ago	3.77117¢ per lb.	$43.72 per gross ton	$43.16 per gross ton
One month ago	3.24473¢ per lb.	$40.51 per gross ton	$40.91 per gross ton
One year ago	3.17956¢ per lb.	$36.38 per gross ton	$41.67 per gross ton

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1948	3.77117¢ June 27	3.22566¢ Jan. 1	$43.94 Aug. 3	$39.58 Jan. 6	$43.16 July 27	$39.75 Mar.
1947	3.19541¢ Oct. 7	2.87118¢ Jan. 7	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 2
1946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan.
1945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 2
1944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 2
1943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
1942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
1941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 1
1940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr.
1939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 1
1938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June
1937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June
1936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June
1935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.38 Apr. 2
1934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 2
1933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan.
1932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July
1931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 2
1930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec.
1929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec.

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy meltin steel scrap quotations to consumer at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Commercial quality sheet grade; prices, 0.25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) 18 gage and heavier. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb and over. (9) Carload lot in manufacturing trade. (10) Hollowware enameling, gages 29 to 31 only. (11) Produced to dimensional tolerances in AISI Manual Sec. 6. (12) Slab prices subject to negotiation in most cases. (13 San Francisco only. (14) Los Angeles only. (15) San Francisco and Los Angeles only. (16) Seattle only. (17) Seattle and Los Angeles only.

PRODUCTS	Prices at producing points apply to the sizes and grades produced in these areas.														
	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		Seatte, S. Fr'isco, Los Angeles	Detroit	Johnstown	
INGOTS Carbon forging	$50.00														
Alloy	$51.00						(per net ton)								
BILLETS, BLOOMS, SLABS Carbon, rerolling[12]	$52.00				$52.00	$52.00	(per net ton)							$52.00	
Carbon forging billets	$61.00	$61.00	$61.00	61.00	$61.00	$61.00	(per net ton)							$61.00	
Alloy	$63.00	$63.00				63.00	(Bethlehem, Canton, Massillon = $63.00) (per net ton)								
PIPE SKELP	3.25						3.25				Warren =3.25				
WIRE RODS	3.40 to 4.15	3.40 to 3.90		3.40	3.40		3.65	3.40			Worcester 3.70	4.05[13] 4.10[14]		3.40	
SHEETS Hot-rolled[6]	3.25 to 3.30	3.25	3.25	3.25-3.30	3.25	3.25	3.25	3.25		Warren, Ashland =3. 25		3.95[15] 4.15[14]	3.45		
Cold-rolled[1]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren =4.00		4.20		
Galvanized (10 gage)	4.40	4.40	4.40		4.40			4.40		4.40	Ashland =4.40	5.15[16]			
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40			4.70		
Long ternes[2] (10 gage)	4.80		4.80							4.80					
STRIP Hot-rolled[3]	3.25 to 3.30	3.25 to 3.30	3.25	3.25 to 3.30	3.25	3.25	3.25	3.25		3.25	Warren =3.25	4.00 to 4.40[15]	3.45		
Cold-rolled[4]	4.00	4.00	4.00	4.00	4.00	4:00	4.00	4.00		New Haven, Warren = 4.00			4.20 to 4.50		
TINPLATE Cokes, 1.50 lb,[5] base box	6.80	6.80	6.80		6.90			6.90	6.90	(Warren, Ohio = $6.80)					
Electrolytic, 0.25, 0.50, 0.75 lb, box	Deduct $1.00, 80¢ and 60¢ respectively from 1.50 lb coke base box price														
TERNES, MFG., special coated	Deduct 90¢ from 1.50 lb coke base box price.														
BLACKPLATE, CANMAKING 55-70 lb, 75-95 lb, 100-128 lb	Deduct $1.60, $1.70 and $1.60 respectively from 1.50 lb coke base box price.														
BLACKPLATE, h.e., 29 ga.[10]	4.75	4.75	4.75					4.85							
BARS Carbon Steel	3.35 to 3.55	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton = 3.35	4.05 to 4.10		3.35	
Reinforcing (billet)[7]	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton = 3.35	4.05 to 4.10		3.35	
Cold-finished[8]	3.95 to 4.00	4.00	4 00	4.00			4.00					4.00[14]	4.30		
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75	Bethlehem, Canton, Massillon = 3.75				4.75[14] to 4.80[14]		3.75	
Alloy, cold-drawn								Massillon= 4.65							
PLATE Carbon steel[11]	3.40 to 3.60	3.40	3.40	3.40	3.40	3.45	3.40	Coatesville = 3.75, Claymont = 3.95 Geneva, Utah = 3.40				4.30[17]	3.65	3.45	
Floor plates	4.55	4.55		4.55											
Alloy	4.40	4.40							Coatesville = 5.10						
SHAPES, Structural	3.25	3.25	3.25		3.25	3.30	Bethlehem = 3.30, Geneva, Utah = 3.25					3.85 to 4.30		3.30	
MANUFACTURERS' WIRE[9] Bright	4.15 to 4.50	4.15 to 4.65		4.15	4.15		4.50	4.25	Duluth, Worcester = 4.15			5.10		4.15	
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester = 5.50 New Haven, Trenton = 5.50			Duluth= 5.20		5.20	
PILING, Steel sheet	4.05	4.05				4.05									

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. producing point

Producing Point	Chromium Nickel No. 304	No. 302	Straight Chromium No. 410	No. 430	No. 442	No. 446
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville, Beth, Brackenridge	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt, Phila, Reading, Ft. Wayne, Titusville, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton, Brackenridge, Balt, Coatesville	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt, Brackenridge	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	26.00	38.00
Strip, c-r, P'gh, Cleve, Jersey City, Reading, Canton, Youngstown, Balt, W. Leechburg	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton, W. Leechburg	32.46	30.30	23.80	24.34	34.82	56.26
Rod, h-r, Syracuse	27.05	25.97	20.82	20.56	24.34	28.75
Tubing, seamless, P'gh, Chi, Canton, Brackenridge, Milwaukee	72.09	72.09	....	68.49	....	....

ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	14.00¢
8 to 16	48, 60, 72	14.50¢
7	48, 60	15.75¢
6	48, 60	17.00¢
4, 5	40	17.50¢
3	40	18.50¢
2½	24, 30	19.00¢
2	24, 30	21.00¢
Carbon		
40	100, 110	6.75¢
35	65, 110	6.75¢
30	65, 84, 110	6.75¢
24	72 to 104	6.75¢
17 to 20	84, 90	6.75¢
14	60, 72	7.25¢
10, 12	60	7.50¢
8	60	7.75¢

TOOL STEEL

(F.o.b. Mill)

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	90.5¢
18	4	1	—	5	$1.42
18	4	2	—	—	$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢

High-carbon-chromium	52¢
Oil hardening manganese	29¢
Special carbon	26.5¢
Extra carbon	22¢
Regular carbon	19¢

Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. mill

	Cents per lb
Armature	5.45
Electrical	5.95 to 6.15
Motor	6.90 to 7.20
Dynamo	7.50 to 7.90
Transformer 72	8.05 to 8.90
Transformer 65	8.60 to 9.60
Transformer 58	9.30 to 10.30
Transformer 52	10.10

RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, 100 lb and heavier, No. 1 O.H., per 100 lb	$3.20
Joint bars, 100 lb	4.25
Light rails (from billets) per 100 lb	3.55

	Base per lb
Cut spikes	5.35¢
Screw spikes	
Tie plate, steel	4.05¢
Tie plates, Pittsburg, Calif.*	4.20¢
Track bolts	7.50¢
Track bolts, heat treated, to railroads	

*Seattle, add 30¢.

C-R SPRING STEEL

Base per pound f.o.b. mill

0.08 to 0.40 carbon	4.00¢
0.41 to 0.60 carbon	5.50¢
0.61 to 0.80 carbon	
0.81 to 1.05 carbon	
1.06 to 1.35 carbon	

Worcester, add 0.20¢

CLAD STEEL

Base princes, cents per pound

Stainless-clad	Plate	Sheet
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa.	*24.00	*22.00
Nickel-clad		
10 pct f.o.b. Coatesville, Pa.	21.50	
Inconel-clad		
10 pct, f.o.b. Coatesville	30.00	
Monel-clad		
10 pct, f.o.b. Coatesville	24.00	
Aluminized steel		
Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

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* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column	*Pittsburg, Calif.*
Standard & coated nails*	103	123
Galvanized nails*	103	123
Woven wire fence†	109	132
Fence posts, carloads††	114	...
Single loop bale ties	106	130
Galvanized barbed wire**	123	143
Twisted barbless wire	123	...

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* Pgh., Chi., Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80 rod spools, in carloads. †† Duluth only.

	Base per 100 lb	*Pittsburg, Calif.*
Annealed fence wire‡	$4.80	$5.75
Annealed, galv. fencing‡	5.25	6.20
Cut nails, carloads‡	6.75	....

‡ Add 30¢ at Worcester; 10¢ at Sparrows Pt. (less 20¢ to jobbers).

HIGH STRENGTH, LOW ALLOY STEELS

mill prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otiscoloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates	5.20	5.20	5.20	5.30	5.20	5.20	5.20	5.20	5.65
Sheets									
Hot-rolled	4.95	4.95	4.95	5.25	4.95	4.95	4.95	.95	5.25
Cold-rolled	6.05	6.05	6.05	..	6.05	6.05	6.05	6.05	6.35
Galvanized		6.75		....	....	6.75	....	....	...
Strip									
Hot-rolled	4.95	4.95	4.95	...	4.95	4.95	4.95	4 95	5.25
Cold-rolled	....	. ..	6.05	....		6.05	6.05		6.35
Shapes	....	4.95	...	....	4.95	4.95	4.95		....
Beams	....	4.95	....	....		....	....	....	....
Bars									
Hot-rolled	5.10	5.10	5.10	....	5.10	5.10	5.10		5.40
Bar shapes	....	5.10	....	....	5.10	5.10	5.10		

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. mills, steel buttweld and seamless. Base price, $200.00 per net ton.

Standard, threaded and coupled

Steel, buttweld	*Black*	*Galv.*
¾-in	46	29½
1-in.	48½	32½
1¼-in.	49	33
1½-in.	47½	33½
2-in.	50	34
2½ and 3-in.	50½	34½
Wrought Iron, buttweld		
½-in.	+20½	+46
¾-in	+10½	+35
1 and 1¼-in	+ 4½	+26
2-in.	— 1½	+22½
2-in.	— 2	+22
Steel, lapweld		
2-in.	39½	23
2½ and 3-in.	43½	27
3½ to 6-in.	45½	29
Steel, seamless		
2-in.	38½	22
2½ adn 3-in.	41½	25
3½ to 6-in.	43½	27
Wrought Iron, lapweld		
2-in.	+ 7½	+30
2½ to 3½-in.	+ 5	+25½
4-in.	list	+19½
4½ to 8-in.	+ 2	+21

Extra Strong, plain ends

Steel, buttweld		
½-in.	41	25
¾-in.	45	29
1-in.	47	32
1¼-in.	47½	32½
1½-in.	48	33
2-in.	48½	33½
2½ and 3-in.	49	34
Wrought Iron, buttweld		
½-in	+16	+40
¾-in.	+ 9½	+33
1 to 2 in.	— 1½	+22
Steel, lapweld		
2-in.	38½	23
2½ and 3-in.	43½	28
3½ to 6-in.	45½	29
Steel, seamless		
2-in.	37½	22
2½ and 3-in.	41½	26
3½ and 6-in.	45	29½
Wrought Iron, lapweld		
2-in.	+ 4½	+26½
2½ to 4-in.	— 5	+15
4½ to 6-in.	— 1	+19½

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft. f.o.b. mill in carload lots, cut length 4 to 24 ft. inclusive.

OD	Gage	Seamless		Electric Weld	
in in.	BWG	H.R.	C.R.	H.R.	C.D.
2	13	19.18	22.56	18.60	21.89
2½	12	25.79	30.33	25.02	29.41
3	12	28.68	33.76	27.82	32.74
3½	11	35.85	42.20	34.78	40.94
4	10	44.51	52.35	43.17	50.78

CAST IRON WATER PIPE

	Per net ton
6-in. to 24-in., del'd Chicago	$98.70
6-in. to 24-in., del'd New York	95.50
6-in. to 24-in., Birmingham	85.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	112.30

Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(*Bolts and nuts f.o.b. Pittsburgh, Cleveland, Birmingham or Chicago*)

Base discount less case lots

Machine and Carriage Bolts	*Percent Off List*
½ in. & smaller x 6 in. & shorter	35
9/16 & ⅝ in. x 6 in. & shorter	37
¾ in. & larger x 6 in. & shorter	34
All diam, longer than 6 in.	30
Lag, all diam over 6 in. long	35
Lag, all diam x 6 in & shorter	37
Plow bolts	47

Nuts, Cold Punched or Hot Pressed

(*Hexagon or Square*)

½ in. and smaller	35
9/16 to 1 in. inclusive	34
1⅛ to 1½ in. inclusive	32
1⅝ in. and larger	27

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller	..	41
½ in. and smaller	38	..
½ in. through 1 in.	..	39
9/16 in. through 1 in.	37	..
1⅛ in. through 1½ in.	35	37
1⅝ in. and larger	28	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts	
Packages, nuts separate	
In bulk	

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets	(*½ in. and larger*) *Base per 100 lb*
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$6.75
F.o.b. Lebanon, Pa.	

Small Rivets	(7/16 *in. and smaller*) *Percent Off List*
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws (*In packages*)	*Percent Off List*
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright	46
¾ to 1 in. x 6 in., SAE 1035, heat treated	35
Set screws, oval points	
Milled studs	
Flat head cap screws, listed sizes	
Fillister head cap, listed sizes	

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF₂ Content:	*Base price per short ton*
70% or more	$35.00
65% but less than 70%	34.00
60% but less than 65%	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports*)

	Per Gross Ton
Old range, bessemer	$6.60
Old range, nonbessemer	6.45
Mesabi, bessemer	6.35
Mesabi, nonbessemer	6.20
High phosphorus	6.20

Increases or decreases in freight rates, dock handling charges and taxes after Apr. 1, 1948, are to be added to above prices.

METAL POWDER

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.9¢ to 9.0¢
Domestic sponge iron, 98+% Fe	9.5¢ to 16.0¢
Eectrolytic iron, annealed, 99.5+% Fe	19.5¢ to 39.5¢
Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe.	44.0¢
Hydrogen reduced iron, minus 300 mesh, 98+% Fe	63.0¢ to 80.0¢
Carbonyl iron, minus 300 mesh, 98%, 99.8+% Fe	90.0¢ to $1.75
Aluminum	23.0¢
Antimony	46.0¢
Brass	24.0¢ to 28.5¢
Copper, electrolytic	30.625¢
Copper, reduced	30.5¢
Cadmium	$2.40
Chromium, electrolytic, 99% min.	$3.50
Lead	24.0¢
Manganese	50.0¢
Molybdenum, 99%	$2.65
Nickel, unannealed	51.5¢
Nickel, spherical, minus 30 mesh	53.0¢
Silicon	29.0¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.0¢
Tin	$1.11
Tungsten, 98%, 99%	$2.90

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	$12.50 to $14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	$16.00 to $18.00
Foundry, Byproduct	
Chicago, del'd	$23.90
Chicago, f.o.b.	20.85
Detroit, f.o.b.	19.40
New England, del'd	22.75
Seaboard, N. J., f.o.b.	21.50
Philadelphia, f.o.b.	19.55
Swedeland, Pa., f.o.b.	20.50
Ashland, Ohio, f.o.b.	18.25
Painesville, Ohio, f.o.b.	20.90
Erie, del'd	19.95
Cleveland, del'd	22.45
Cincinnati, del'd	21.40
St. Louis, del'd	20.98
Birmingham, del'd	17.86

REFRACTORIES

(*F.o.b. Works*)

Fire Clay Brick	*Carloads, Per 1000*
First quality, Pa., Md., Ky., Mo. (except Salina, Pa., add $5)	$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo.	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50)	11.50

Silica Brick	
Mt. Union, Pa., Ensley, Ala.	$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	85.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	$14.75 to 15.00
Silica cement, net ton, bulk, Utah and Calif.	21.00

Chrome Brick	*Per Net Ton*
Standard chemically bonded, Balt., Chester	$69.00
Magnesite Brick	
Standard, Balt., and Chester	$91.00
Chemically bonded, Balt. and Chester	80.00

Grain Magnesite

	Std. ⅝-in. grains
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed	$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	$30.50 to 31.00
in sacks with fines	35.00 to 35.50

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, pet net ton, bulk. Midwest, add 10¢; Missouri Valley, add 20¢	$11.85

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
New York	5.53	6.43	7.48	5.58	....	5.78	5.58	5.63	6.38	9.53	9.68	10.40	10.55
Boston	4.49- 5.64	6.39- 6.54	7.59- 7.78	5.54- 6.04	6.94	5.74- 5.89	5.54	5.59- 5.69	6.34- 6.39	9.55	9.70	11.00	11.15
Baltimore	5.28	6.18	7.38	5.34	....	5.53	5.33	5.39	6.13	....	....	....	....
Chicago	4.85	5.75	6.95	4.85	6.15	5.10	4.90	4.90	5.70	9.00	9.15	....	....
Milwaukee	5.02	5.92	7.12	5.02	6.32	5.22	5.07	5.07	5.87	9.15	9.32	10.57	10.72
Cleveland	4.98- 5.20	5.75- 6.04	7.24	5.02- 5.65	....	5.35- 5.54	5.16- 5.19	5.15- 5.34	5.90- 5.95	9.14- 9.29	9.44- 9.79	10.54	10.69 .....
Buffalo	5.25	6.00	7.75	5.70	....	5.61	5.25	5.35	6.05	....	....	....	....
St. Louis	5.19	6.04	7.29	5.19	....	5.44	5.24	5.24	6.04	9.34	9.49	.....	.....
Pittsburgh	4.35- 4.90	5.75	6.95	5.00- 5.10	5.95	5.05- 5.25	4.90- 5.15	4.90- 5.10	5.65- 5.80	9.00	9.15	.....	.....
St. Paul	5.41	6.31	7.51	5.41	....	5.66	5.46	5.46	6.26	9.56	9.71	10.96	11.11
Birmingham	5.20	6.51	6.60	5.20	6.51	5.40	5.15	5.15	6.51	.....	.....	.....	.....
Los Angeles	6.30- 6.40	7.85- 7.90	7.95- 8.55	6.60- 6.66	....	5.95- 6.10	5.75- 5.90	6.05	7.85- 7.95	10.35	10.20	11.75	11.95
San Francisco	5.95	7.15	7.65	6.40	....	6.30	5.90	5.90	7.55	10.35	10.20	11.75	11.95
Salt Lake City	7.05	....	8.45	7.35	....	6.40	6.80	7.25	7.55	.....	.....	.....	.....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

NOTE: Where more than one price is being quoted by warehouses in a given area the lowest and the highest prices quoted there appear above. The reduction in the number of cities at which prices are quoted is not permanent. Additional points will be added as soon as more details on quotations can be obtained from those points.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	44.00	44.50	45.00	45.50	.....
Birmingham	42.88	43.38	.....	.....	.....
			.....	.....	.....
Buffalo	44.00	44.00	44.50	.....	.....
Chicago	42.50	43.00	43.50	44.00	.....
Cleveland	43.00	43.50	43.50	44.00	.....
Duluth	43.00	43.50	44.00	44.00	.....
Erie	42.50	43.00	43.50	40.00	.....
Everett	.....	48.75	49.25	.....	.....
Granite City	45.25	45.75	46.25	.....	.....
Neville Island	42.00	42.50	42.50	43.00	.....
Provo	43.00	43.50	.....	.....	.....
Sharpsville	43.00	43 50	43.50	44.00	.....
Steelton	44.00	44.50	45.00	45.50	50.00
Struthers, Ohio	42.50	.....	.....	.....	.....
Swedeland	45.00	45.50	46.00	46.50	.....
Toledo	42.50	43.00	43.50	44.00	.....
Troy, N. Y.	.....	.....	.....	.....	50.00
Youngstown	43.00	43.50	43.50	44.00	.....

DELIVERED PRICES† (BASE GRADES)

Consuming Point	Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	$0.50 Arb.	.....	48.75	49.25	.....	.....
Boston	Steelton	6.27	50.27	50.77	51.27	51.77	56.27
Brooklyn	Bethlehem	3.90	47.90	48.40	48.90	49.40	.....
Cincinnati	Birmingham	6.09	48.97	49.47	.....	.....	.....
		.....			.....	.....	.....
Jersey City	Bethlehem	2.39	46.39	46.89	47.39	47.89	.....
Los Angeles	Provo	6.93	49.93-	50.43	.....	.....	.....
Mansfield	Cleveland-Toledo	3.03	46.03	46.53	46.53	47.03	.....
Philadelphia	Bethlehem	2.21	46.21	46.71	47.21	47.71	.....
Philadelphia	Swedeland	1.31	46.31	46.81	47.31	47.61	.....
Philadelphia	Steelton	2.81	46.81	47.31	47.81	48.31	52.81
San Francisco	Provo	6.93	49.93	50.43	.....	.....	.....
Seattle	Provo	6.93	49.93	50.43	.....	.....	.....
St. Louis	Granite City	0.75 Arb.	46.00	46.50	47.00	.....	.....

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct); phosphorus differentials, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio—$53.50; f.o.b. Buffalo—$57.75. Add $1.25 per ton for each additional 0.50 pct Si. up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $58.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $65.55. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Phila., New York.

Baltimore, Phila., New York	$145
F.o.b. Birmingham	$150
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont.	$145
Carload lots (bulk)	$145
F.o.b. Rockwood, Tenn.	$150
Less ton lots (packed)	$189
F.o.b. Etna, Pa.	$148

$1.80 for each 1% above 82% Mn; penalty, $1.80 for each 1% below 78%.

Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	8.70	8.95	9.50
Ton lots	10.30	10.90	12.80
Less ton lots	11.20	11.80	13.70

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$51.00	$52.00
F.o.b. Pittsburgh	55.00	56.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	32
L.c.l. lots	34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.07% max. C. 0.06% P, 90% Mn.	23.00	24.85	26.05
0.10% max. C.	22.50	24.35	25.55
0.15% max. C.	22.00	23.85	25.05
0.30% max. C.	21.50	23.35	24.55
0.50% max. C.	21.00	22.85	24.05
0.75% max. C., 7.00% max. Si.	18.00	19.85	21.05

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload bulk	7.80
Ton lots	9.45
Briquet, contract, basis, carlots, bulk freight allowed, per lb of briquet	8.75
Ton lots	10.35
Less ton lots	11.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct., f.o.b. Keokuk, Iowa, openhearth $78.00, foundry, $79.00; $78.75 f.o.b. Niagara Falls; $77.50 f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe.	16.90	17.50	18.10
97% Si, 1% Fe.	17.30	17.90	18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk	5.25	5.50	5.70
Ton lots	6.85	7.45	7.75
Less ton lots	7.75	8.35	8.65

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
25% Si	16.50	....	....
50% Si	9.30	9.80	10.00
75% Si	11.80	12.10	12.85
85% Si	13.30	13.60	14.35
90% Si	15.00	15.30	16.00

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast	Turnings	Distilled
Ton lots	$1.85	$2.70	$3.40
Less ton lots	2.20	3.05	4.20

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, Contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	26.50	26.90	27.00
0.10% C	26.00	26.40	26.50
0.15% C	25.50	25.90	26.00
0.20% C	25.25	25.65	25.75
0.50% C	25.00	25.40	25.50
1.00% C	24.50	24.90	25.00
2.00% C	24.25	24.65	24.75
65-69% Cr, 4-9% C	18.60	19.00	19.15
62-66% Cr. 4-6% C. 6-9% Si.	19.45	19.85	20.00

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	12.50	12.75	12.85
Ton lots	14.00	14.90	15.50
Less ton lots	14.90	15.80	16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	19.70	20.10	20.25
Ton lots	21.85	23.15	23.95
Less ton lots	23.35	24.65	25.45

..Low carbon type: 62-66% Cr, 4-6% Si, 4-6% mn, 1.25% max. C.

	Eastern	Central	Western
Carload	25.00	25.40	25.50
Ton lots	27.30	27.95	29.15
Less ton lots	29.10	29.75	30.95

Chromium Metal

Contract prices, cents per lb, chromium contained carload packed, f.o.b. shipping point freight allowed, 97% min. Cr. 1% max. Fe.

	Eastern	Central	Western
0.20% max. C.	97.00	98.50	99.75
0.50% max. C.	93.00	94.50	95.75
9.00% min. C.	91.50	93.00	94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe Cr 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	16.25	16.75	18.80
Ton lots	19.35	20.10	22.25
Less ton lots	20.85	21.60	23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	17.50	18.00	20.05
Ton lots	19.80	20.65	22.40
Less ton lots	20.80	21.65	23.40

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

	Eastern	Central	Western
Ton lots	18.00	19.10	21.05
Less ton lots	19.25	20.35	22.30

V Foundry Alloys

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn. V-7: 28-32% Cr, 15-21% Si, 14-16% Mn.

Ton lots	14.60¢
Less ton lots	15.85¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed. Si 56%, Ti 9%, Ca 5%.

Ton lots	17.90¢
Less ton lots	19.40¢

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.75	16.85	18.80
Less ton lots	17.00	18.10	20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained W, 5 ton lots, freight allowed	$2.25
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound Contained V_2O_5	$1.20
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb	
Ton lots	$2.50
Less ton lots	$2.55
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	95¢
Calcium molybdate, 45-50%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	80¢
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo.	80¢
Molybdenum oxide in bags, f.o.b. Langeloth and Washington, Pa., per pound contained Mo.	80¢
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	$1.23
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	$1.35
Less ton lots	$1.40
High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton	$152.50
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.00
10 tons to less carload	$75.00
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	18.40¢
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy.	
Carload, bulk	6.00¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	7.20¢
Ton lots	7.70¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	10.50
Ton lots	11.25

Boron Agents

Contract prices per pound of alloy, f.o.b. shipping point, freight allowed.

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Western
Ton lot	$1.20	$1.21	$1.23

Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots.	2.01	2.023	2.055

Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni.

Less ton lots	$1.80	$1.81	$1.84

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.	
Carload lots	39.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y., freight allowed, Ti 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3%-4%, Si 40%-45%, per lb contained B	$6.25

New Fisher Body Plant Has Begun Production

Cleveland

• • • **Production of** station wagon bodies for Chevrolet and Oldsmobile divisions of General Motors has been started at the new Fisher Body plant here, according to F. R. Hook, resident manager.

Production in the initial stages has been approximately five bodies per hr and will climb steadily until an estimated average of 4500 monthly is reached sometime in 1949, Mr. Hook said.

The plant, acquired by Fisher Body in Oct. 1947 from Harry Ferguson, Inc., has taken over the station wagon production from the Fisher Body Plant No. 1 in Cleveland and will expand its operation considerably in the next year. In addition, completely finished panel delivery truck bodies will be manufactured at this plant.

Finished station wagon bodies will be shipped to 11 assembly plants, 10 Chevrolet and the home factory of Oldsmobile, scattered throughout the United States when full-scale production has been reached, Mr. Hook said.

The plant was originally built by the War Assets Administration in 1943 for the Cleveland Pneumatic Aerol Co. It has a floor area of 878,000 sq. ft.

The plant has 13,414 ft of body conveyor and a capacity of 843 bodies on the conveyor line system at one time. Thirty-one railroad box car shipments daily are expected to leave the plant at peak production.

Tennessee's Founders Organize New Society And Elect Officers

Cleveland

• • • **Gray iron foundry** management executives in Chattanooga and Knoxville have formed a Tennessee group of Gray Iron Founders' Society with Ormond C. Corry, president, Harrison Corry, Knoxville, as chairman of the new organization.

Representatives of leading producers of gray iron products who attended the organizational meeting heard the society's executive vice president, R. C. Collier, Cleveland, describe the society's long-range program for the improvement of the industry and its products. He said the society has established a technical department under the leadership of gray iron foundry expert of outstanding reputation.

The society represents exclusively the producers of gray iron castings, second largest metalworking industry in the United States, ranked only by the steel industry in point of size.

Coming Events

Aug. 30-Sept. 3 **American Chemical Society,** national meeting, Washington.
Sept. 6-10 **American Chemical Society,** national meeting, St. Louis.
Sept. 13-17 **American Chemical Society,** national meeting, Portland, Ore.
Sept. 13-17 **Instrument Society of America,** conference and exhibit, Philadelphia.
Sept. 28-Oct. 1 **Assn. of Iron & Steel Engineers,** Convention and Iron and Steel Exposition, Cleveland.
Oct. 5-7 **Industrial Packaging Engineers Assn.,** Industrial Packaging and Materials Handling Exposition, Chicago.
Oct. 5-9 **Concrete Reinforcing Steel Institute,** semiannual meeting, Asheville, N. C.
Oct. 11-13 **National Lubricating Grease Institute,** annual convention, Chicago.
Oct. 13-15 **Porcelain Enamel Institute,** annual forum, Urbana, Ill.
Oct. 22-25 **Metal Treating Institute,** annual meeting, Philadelphia.
Oct. 23-29 **American Society for Metals,** annual convention, Philadelphia.
Oct. 24-29 **American Welding Society,** annual meeting, Philadelphia.
Oct. 25-28 **American Institute of Mining and Metallurgical Engineers, Metals Div.,** annual meeting, Philadelphia.
Oct. 25-29 **National Metal Exposition,** Philadelphia.
Oct. 27-28 **Society for Nondestructive Testing,** annual convention, Philadelphia.

Retires With 45 Years In the Steel Industry

Lebanon, Pa.

• • • **William B. Sullivan** rounded out 45 years of service in the steel industry when he retired on Aug. 1 as manager of alloy sales with the Lebanon Steel Foundry.

Prior to coming with Lebanon, in 1935, Mr. Sullivan served in various executive capacities with several leading steel casting and allied companies.

William B. Sullivan

Mr. Sullivan has been a pioneer in the development of high temperature heat resistant alloys, and holds a number of patents in this field.

In acknowledgment of his contributions to the industry, in connection with his retirement Mr. Sullivan has been made an honorary life member of the Alloy Casting Institute.

Request Steel Allocation For Mining Equipment

Washington

• • • **A request for** allocation of up to 683,000 tons of steel annually for production of bituminous coal mining equipment and parts is to be presented to the Office of Industry Cooperation.

This figure is the amount estimated by the National Bituminous Coal Advisory Council as the amount necessary if adequate production of bituminous coal is to be maintained over the next few years.

The Council has given this estimate to the Interior Dept. and says it was based upon an estimated requirement of 620 million tons of coal annually. The recommendation will be turned over to OIC after it has been screened by Interior.

Of the total steel tonnage requested, 306,700 would be for production of mine machinery and parts and the remaining 376,300 tons would be channeled to underground and strip mining supplies.

Growth of postwar mining mechanization, the Council says, has created a growing demand for cutters, loaders and drills.

Committee Announces Interim Allocations Of Tin Metal Exports

Washington

• • • **The Combined Tin** Committee has announced interim allocations of tin metal for the second half of 1948 amounting to 28,685 long tons. The allocations now made, together with those to be made to countries which have not yet reported their requirements, represent at least 75 pct of the total allocations that can be expected during this period. The committee plans to distribute the balance available in September after final statistics for the first half of 1948 have been studied. A revised questionnaire calling for final data for the first half of 1948 will be forwarded shortly to representatives of the consuming countries.

The first interim allocations for the second half of 1948 are as follows:

Country	Amount (Long Tons)
Australia	195
Austria	225
Canada	1755
Czechoslovakia	535
Denmark	260
France	4290
Greece	65
India	2135
New Zealand	235
Norway	130
Poland	860
Romania	80
Sweden	325
Switzerland	260
Syria	50
Turkey	225
United States	16640
Yugoslavia	260
*Others	160
Total	28685

*Latin America, other than Argentina, Brazil, Chile, Uruguay, and Mexico, and Middle East, other than Egypt, Palestine, Syria and Iran. These countries are normally provided for by individual allocations.

Hanna Co. Shows Profit

Cleveland

• • • **M. A. Hanna** Co. has reported consolidated net profits of $3,949,668 for the first half of 1948. The profit is after provision of $1,169,680 for depreciation and depletion and $1,099,695 for federal income taxes. This is equal after preferred dividends to $3.64 a share on the 1,030,464 common shares.

Net profit in the first half of 1947 was $3,032,491, equal to $2.74 a common share, after provision of $782,742 for depreciation and depletion and $756,785 for federal taxes.

Net profit for the second quarter of 1948 was $2,499,145, equal to $2.33 a common share, compared with $1,890,677, or $1.73 a common share, in the corresponding period of 1947.

BAKER TRUCKS help SHERWIN-WILLIAMS save $288,000.00 per year

Tiering cartons on pallets three high with Baker Fork Truck to conserve storage space.

Baker Fork Truck tiers drums on pallets three high.

Baker Fork Truck removes pallet loads from trailers and tiers them three high.

Box car or truck loading is speeded by handling pallet loads with fork truck.

● The profitable application of Material Handling Engineering is convincingly demonstrated by Sherwin-Williams in their recently constructed Chicago warehouse. Designed by Albert Kahn for the most modern methods and equipment, it has effected savings amounting to $288,000.00 per year, which represents more than 30% of the investment required.

BAKER Trucks play an important role in reducing man hours for handling by 42.5% while increasing tonnage by 86%. Other equipment includes pallets, special racks, trailers and drag-chain conveyors.

Flow CONTEST WINNER

The detailed account of this material handling operation won second prize in the 1947 Flow Cost Analysis Contest for Charles H. Day, Assistant to General Manager, Chicago Operations, Sherwin-Williams Company. It appeared in the May and June 1948 issues of Flow magazine.

If you have a material handling problem, your nearest Baker representative, who is a qualified Material Handling Engineer, will gladly show you how you can make similar savings.

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Baker INDUSTRIAL TRUCKS

Oxygen in the Electric Furnace

(Continued from page 75)

ately after the bath is melted. This injection, which takes only 2 to 5 min, is sufficient to raise the bath temperature and start the carbon removal, so that a small amount of ore may be used to bring the carbon within specification while the bath is being brought to tapping temperature. By utilizing oxygen at this stage of the cycle, power savings of 10 to 15 pct may be realized.

In this particular application, starting at a relatively low temperature, the oxygen forms FeO which goes to the slag to satisfy slag-metal equilibrium conditions, so that the overall chemical efficiency of the oxygen is not as high as would be expected. It is still economical to sacrifice oxygen efficiency for power and timesaving. In some instances, oxygen can be used to maintain the regular heat progress when it is necessary to cut down or cut off power because of peak load demands. This particular use of oxygen should be approached somewhat conservatively, since the use of oxygen to replace power must be studied carefully for each application. Otherwise the somewhat indiscriminate use of oxygen may prove costly.

While existing data indicate the use of oxygen to be economical in acid furnaces, little work has been done on fundamental relations between slag and metal in using oxygen. There has been no difficulty when using oxygen of shaping the slag properly, although in some instances the rapid temperature rise and viscous slag produced in the lower carbon ranges has required small additions of lime to increase slag fluidity.

The quality of castings produced when oxygen has been used in place of ore has, in all cases, been equal to the quality obtained in normal practice. Some tests have indicated that the physical properties of aged and unaged test bars are equal, and in certain shops, it is believed that the use of oxygen in the bath tends to give more fluid metal, producing clean, sharp castings with good shrinkage and soundness. However, until sufficient evidence is at hand to support other conclusions, it may be stated that the use of oxygen does not in any way affect adversely the quality of the castings.

The experiences of using oxygen in small acid furnaces for production of alloy and stainless heats is similar to that of the basic furnaces. Very rapid carbon elimination and chrome conservation are realized. This is particularly important, since the usual acid practice involves no attempt to recover chromium from the slag. Moreover, in the smaller furnaces, the rate of oxygen injection, compared to the volume of metal, is generally somewhat higher than in the large furnaces, so that the temperature effect is more pronounced. Temperature increases of 200° to 300°F in 3 min are not unusual when working with stainless heats. While oxygen efficiency is not high when treating alloy material, nevertheless the time and power saving and chrome conservation make oxygen utilization economical.

Since most foundries making stainless steel utilize virgin metals for charges, carbon elimination in working the heats is not a problem. However, if the bath becomes contaminated due to a broken electrode or to off-analysis charge constituent, then oxygen can be used to produce quality material, where otherwise the heat might be scrapped or diverted because the carbon would finish too high. In addition, there are in some shops quantities of plant scrap which may be contaminated with high carbon materials. By utilizing oxygen to refine charges containing such materials, valuable alloy ingredients are recovered which would otherwise be lost. Stainless grade heats with satisfactory chromium recovery have been made in which the carbon was reduced from over 1.0 pct to produce a 0.07 C max specification.

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2 U. S. Patent No. 1,570,229.
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Getting the Most Out of Mounted Wheels and Points

(Continued from page 87)

About the same considerations govern the selection of the specifications for mounted points and wheels as govern the selection of regular grinding wheels. For all steels, a point made of special friable aluminum oxide can be used. Such points should be employed for the nitrided steels used for making dies and for stainless steel. For breaking corners, burring and chamfering, regular aluminum oxide in a hard bond should be used. For cast iron, nonferrous metals, glass, plastics and cemented carbide, use silicon carbide.

The grits used are 36, 46, 60, 90, 120 and 150. The size to use depends upon the desired speed of material removal and the finish. Sometimes the size depends upon the shape of the point. A finer grit will hold its shape better than a coarser one, and so is used in grinding that puts extraordinary wear upon the wheel. For touching up dies and tools and general shop work 60 or 90 is a good general purpose grit.

Vitrified bond can be used for most work found in the average shop. Resinoid bonds are used mostly for special jobs. They are used in the large sizes for snagging nonferrous metals and stainless steel, where high speed operation is the rule. For mounted points and wheels, a selection of the standard grades—M, O and Q will meet nearly all needs.

anadian Production of Pig Iron Drops Slightly Ferroalloy Tonnage Up

ronto

• • **Canadian** pig iron produc- on for April totalled slightly less an that for the previous month, it the daily average rate rose to .7 pct., from 74 pct., in March. pril production amounted to 170,- 5 net tons, against 172,675 tons March and 160,749 tons in April, 47. For the month under review tput included 136,323 tons of basic on of which 132,669 tons were for rther use of producers and 3654 ns for sale; 18,549 tons of foundry on with 1,893 tons for further use nd 16,656 tons for sale, and 15,913 ns of malleable iron all for sale.

Blast furnace charges in the onth included 318,664 tons of iron re; 21,209 tons of mill sinder, scale, nter, etc., and 6449 tons of scrap.

For the four months ending with pril pig iron output totalled, 654,- 25 net tons compared with 653,097 ons for the like period of 1947 and 87,032 tons in 1946.

Production of ferroalloys in arch amounted to 14,474 net tons s compared with 14,293 tons for arch and 13,015 tons for April, 947. In the month under review utput included by tonnage, ferro- ilicon, ferro-silicomanganese, fer- omanganese, ferrochrome, hrom-x and ferrophosphorus. For he first four months this year out- ut totalled 57,715 net tons, against 6,213 tons for the same period of 947 and 43,283 in 1946.

Following are comparative pro- uction figures for 1948 in net tons:

1948	Pig Iron	Ferro-alloys
January	160,042	17,125
February	151,123	11,823
March	172,675	14,293
April	170,785	14,474
Total 4 Months	654,625	57,715

Sets Up Aluminum Dept.

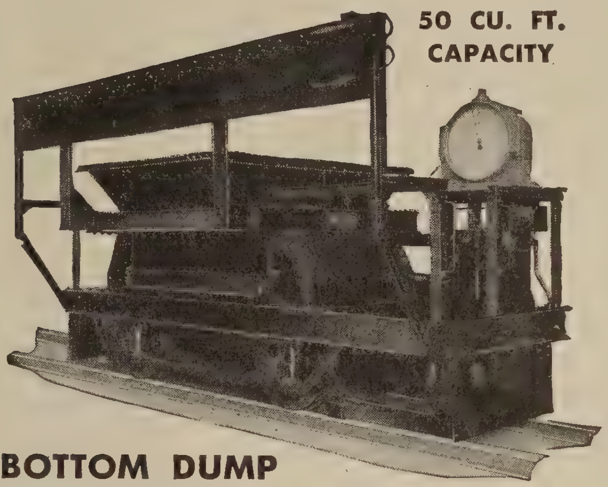
Philadelphia

• • •**The Dreifus Steel** Corp. has opened up a department for the purchase and sale of aluminum products. The new section will be managed by Thomas McDermott of the former firm of Hennessey & McDermott, Phildelphia, aluminum export merchants.

ATLAS

SCALE CHARGING CARS MOVE MATERIALS with ECONOMY

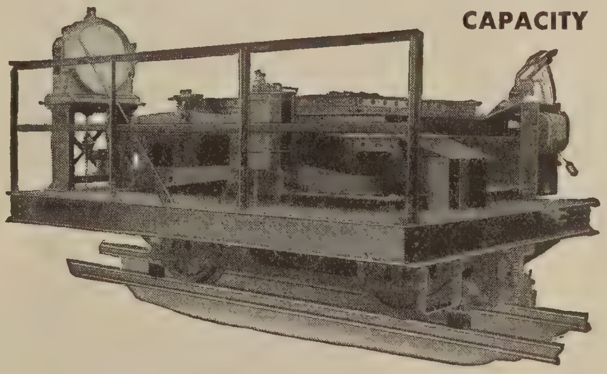
50 CU. FT. CAPACITY



BOTTOM DUMP SCALE CAR

Single hopper type with double-undercut discharge gate. Equipped with Atlas All-Steel Scales and Atlas 24" Dial. Propelled by 10-HP motor. Journals mounted on roller bearings and standard safety equipment is included.

80 CU. FT. CAPACITY



BOTTOM DUMP SCALE CAR

Car propelled by 30-HP motor and arranged with operating platform at the side. Foot operated band brake and hand operated discharge gates. Atlas loop suspension type scales with 24" Atlas dial.

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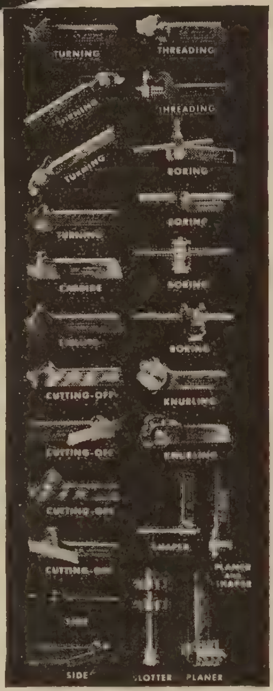

Standard Wherever Metal is Machined

Over 96% of the machine shops and tool rooms use ARMSTRONG TOOL HOLDERS, because each is a permanent, multi-purpose tool that does the work of a complete set of forged tools. Each is a stronger, more efficient tool that takes cutter bits quickly ground from stock shapes of high speed steel, thus "Saves: All Forging, 70% Grinding and 90% High Speed Steel."

With the correct ARMSTRONG TOOL HOLDERS for each operation you will be permanently tooled-up for every operation on lathes, planers, slotters and shapers. They are sold by all leading industrial distributors.

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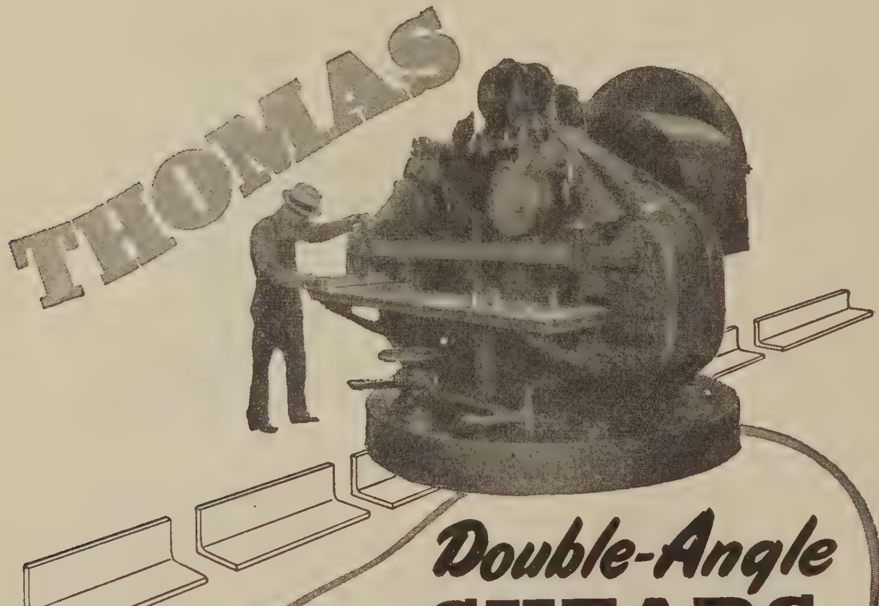

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For further information ask for Bulletin 310.

THOMAS
MACHINE MANUFACTURING COMPANY
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15

Navy Consolidates Schools At Montere

Annapolis, Md.

• • • **Congress** has provided th Navy with funds to operate an independent educational institutio for graduate and postgraduate instruction at Monterey, Calif.

At present the school consists o 3 relatively independent divisions the Engineering and Scientific division at Annapolis; the Genera Lines Schools at Newport, R. I., an the Naval Intelligence school a Anacostia, D. C. Ultimately all divisions will be concentrated a Monterey.

Of particluar interest is the program of the graduate division i science and engineering. This division provides graduate and postgraduate courses in scientific fundamentals of mathmatics, mechanics, physics and chemistry and i the specialized fields of electrica engineering, electronics, metallurgy, mechanical engineering, meteorology and aeronautics. Complete curriculums leading t master's degree in engineerin electronics, aerology, and naval engineering are conducted by thi division. Other curriculums prepare student officers for specialize work at cooperating civilian institutions.

ACS to Hear Atomic Repor

New York

• • • **New chemical** techniqu with which scientists are chartin the course of the atomic age are t be reported at the American Chemical Society's first symposium o nucleonics and analytical chemistr at Northwestern University on Au 13 and 14.

Ten of the nation's outstandin authorities on nuclear chemistr will discuss subjects such as the us of radioactive isotopes as tracers i research, ultrasensitive instrument used for measuring radioactivit and industrial applications of ne analytical methods.

Dr. Clement J. Rodden, chief o the section of uranium and relate materials of the National Bureau o Standards, is chairman of the symposium. Dean Samuel C. Lind o the University of Minnesota Institute of Technology is honorar chairman.

dd to Building Products

uisville, Ky.

• • **Aluminum nails** of 6 types d 16 different sizes have been ded to the list of aluminum ilding products being made by e Reynolds Metal Co., according an announcement by David P. ynolds, vice president of the mpany's aluminum division.

Types of nails include the comon, special roofing, barbed, speal roofing barbed with patented ra-lee washer, 3D shingle, 1¼ aster board and felt paper nails. ead diameters range from 11/32 9/16 in. and lengths from 7/8 to ½ in.

Several advantages in using uminum nails were cited: they eigh 1/3 as much as steel nails hich gives 3 times as many nails er pound of shipping weight; they re highly resistant to corrosion nd stain and the base price of luminum is now 30 pct below prear levels.

rices Increased by G.M.

etroit

• • **In order** to offset increased osts, General Motors has increased he prices of some of its replaceent parts. Price adjustments were ade on an individual item basis fter a careful study had been ade of the cost of each part. The eighted average of the current djustment in prices is approxiately 5.9 pct.

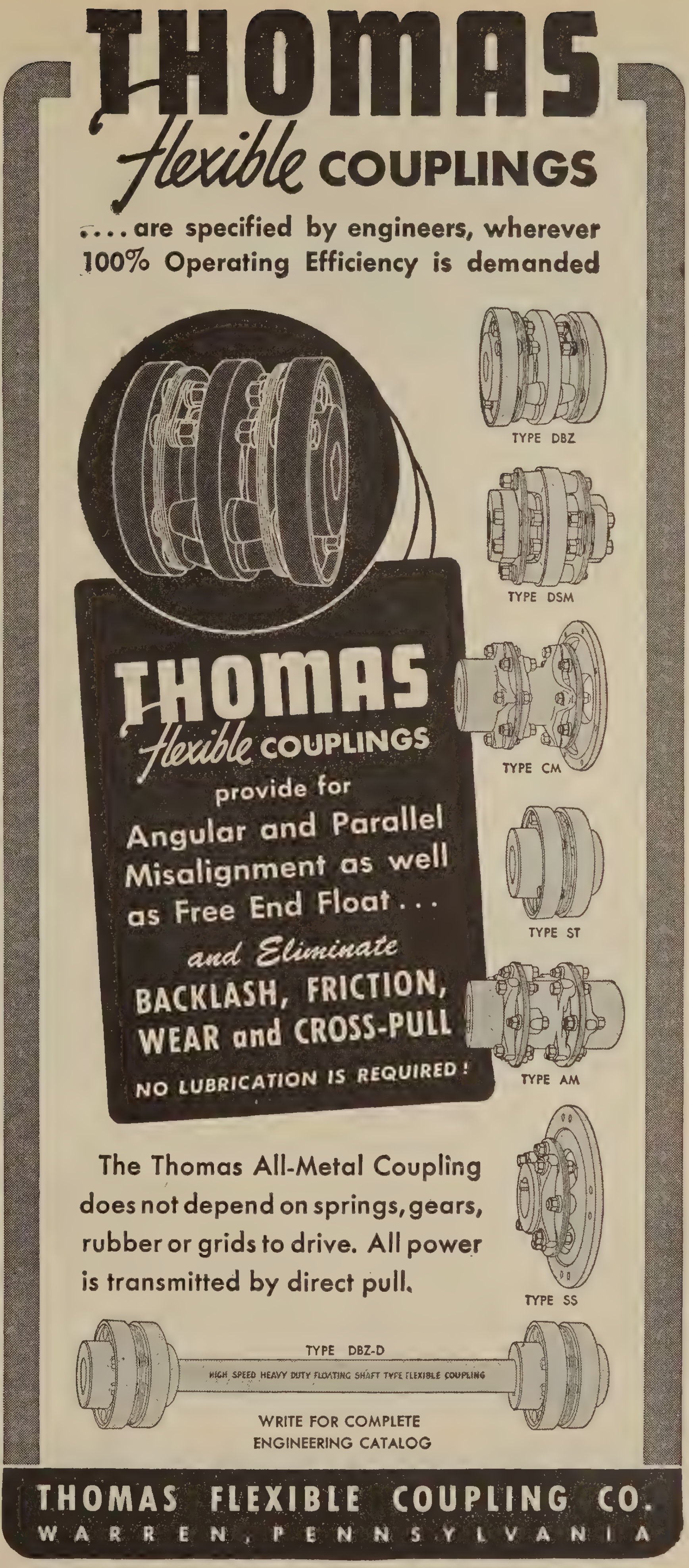
Even with the latest price hanges, the overall average inrease in the retail prices of General Motors replacement parts since he fall of 1940 amounts to only bout 45 pct., as contrasted to an ncrease of 70 pct. in the consumer rice index for the same period.

Prefab Allocations Aired

Washington

• • • **The Office** of Industry Cooperation this week held public hearings on a proposal to set up a voluntary allocation plan involving 59,000 tons of steel sheet and strip prefabricated steel houses.

The proposed voluntary agreement would cover steel for factory-made steel houses only. Such products as bathtubs, sinks, lavatories, kitchen and undersink cabinets, dish and clothes washing machines, exhaust fans, lighting fixtures, water and heating units would not be included.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THOMAS *Flexible* COUPLINGS provide for Angular and Parallel Misalignment as well as Free End Float . . . *and Eliminate* BACKLASH, FRICTION, WEAR and CROSS-PULL

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PIONEERING PERFECTION in Crane Design

Expect the most from *Mobilcranes,* for here are sturdy, powerful machines incorporating proved advancements in design and construction. Pioneering the very features that have become standard for the industry, **OSGOOD** and **GENERAL** have developed, in *Mobilcranes,* smooth-working, efficient units that will handle the biggest jobs in record time.

Whatever your materials-handling problem, you'll find that **OSGOOD** and **GENERAL** *Mobilcranes*—one-man operated, one-engine powered, mounted on rubber—can do the job at a savings in time, money and manpower.

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MARION, OHIO

Weld Pipe Mill Approved

Toronto

• • • **Directors of** Page-Hershey Tubes Ltd., 100 Church St., Toronto have approved expenditure for the erection of a new electric weld pipe mill of special design to replace the present lapweld mill at Welland. The old mill has been in operation since 1910.

It will not be necessary to assume the heavy additional expenditure essential for auxiliary equipment finishing, threading, testing and storage and shipping, which such a changeover would ordinarily entail, as the lapweld finishing department, with machines of latest design, can take care of the production of the new unit.

The new plant will enable the company to participate to a larger degree in the pipe requirements of the oil and gas industries.

Turbine Plant Sets Record

Schenectady, N. Y.

• • • **During the** first 6 months of 1948 General Electric Corp.'s turbine plant here has produced turbine generators with a combined kilowatt capacity greater than that of all the units manufactured at the plant in 1947, according to J. W. Belanger, manager of the company's turbine division.

In the half year period ending June 30, 30 units representing 1,237,500 kw were built and tested, as compared with 34 units having a total capacity of 1,173,750 kw for 1947.

Based on this record performance, Mr. Belanger predicted that the plant would reach 2.8 million kw in 1948 which would exceed by more than 1 million kw the figure for any previous year in the plant's history.

Bauxite Reports Released

Washington

• • • **Three more** reports in the 18-volume series covering the government's wartime investigation of Arkansas bauxite are now ready for distribution. The Arkansas investigation resulted in addition of 12 million tons of recoverable bauxite to the nation's known reserves.

The reports cover drill-hole information in Pulaski county and are Vols. VII (R.I. 4257), VIII (R.I. 4258) and IX (R.I. 4259). They may be obtained free from the Bureau's Pittsburgh office at 4800 Forbes St.

Poland Places Orders With Great Britain For Capital Goods

London

• • • **The Polish** Purchasing Mission in the United Kingdom has placed orders for iron and steel products valued at $16 million. Negotiations for the purchase of an additional $20 million worth of products are continuing and are expected to be completed within the next 3 months. The orders are being placed in accordance with the Anglo-Polish Trade Agreement, which provides for the purchase of $60 million of capital goods in Great Britain. A credit of $24 million has been granted to facilitate these purchases.

Among the larger orders placed by Poland are two tankers for $4 million. Platt Bros., a Lancashire firm, has orders for $5.6 million of textile machinery. Orders have been placed for chassis for buses (Leyland) for about $800,000, textile machinery for jute with Fairbairn, Lawson & Co., Ltd., for about $1 million and pulverising mills for $600,000 with Alfred Herbert.

Lukens Offers Booklet To Visitors and Public

Coatesville, Pa.

• • • **Since the** summer of 1947, almost 10,000 visitors have taken advantage of the openhouse-plant visitation offered by the Lukens Steel Co. here.

At the conclusion of each tour the visitor is given as a souvenir a 28-page booklet entitled, "A Visit To Luken". Copies of these booklets are now available on request.

Printed in two colors and illustrated with numerous photographs, the booklet describes the open hearth departments and traces manufacturing operations through the company's 120-in. plate mill, its 206-in. mill, the world's largest plate mill, the grinding and trimming shops and the flanging department.

In addition the booklet describes the clad steels department and gives highlights of the heat treating department, the shearing, pressing, bending, blanking and flame cutting plants of By-Products Steel Co. division and the two plants of the Lukenweld division where weldments, machinery components and completed machinery are fabricated and welded.

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There's a Detrex solvent or cleaning compound for *every* cleaning application—a *specialized* cleaning agent, scientifically designed for maximum speed and economy. These include:

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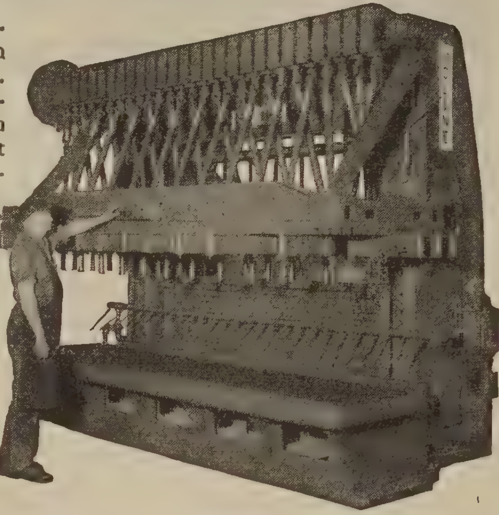

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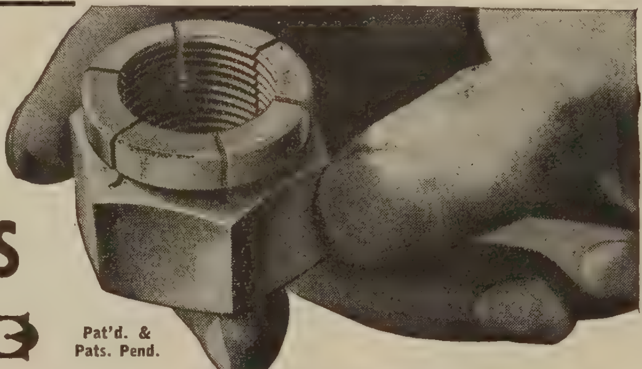

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SELF-LOCKING NUTS

The one-piece, all-metal "Flexloc" packs maximum usefulness in minimum space by combining, as it does, a stop, a lock and a plain nut all in one.

Every thread—including the locking threads—takes its share of the load. "Flexloc" accommodates itself to a wide range of thread tolerances . . . can be used over and over again without losing much of its locking torque . . . is not affected by temperatures likely to be met within the field of Mechanical Engineering . . . and being a "stop" nut, it stays locked in any position on the threaded member. The "Flexloc" is processed to have an exceptionally uniform torque. The *Thin* "Flexloc" has become very popular because its *tensile* is so high and the space it occupies so small.

Sizes from #6 to 2" in diameter—in "regular" and "thin" types—in NC and NF thread series. *Write for "Flexloc" Catalog.*

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Railroad Car Backlog Increases by 3075 Since July 1, 1947

Washington

• • • **All railroads** and private carlines had 122,181 new freight cars on order as of July 1, 1948, the Assn. of American Railroads has announced. The number on order on July 1, 1947, was 109,006.

Of the total number, Class I railroads and railroad-owned private-controlled refrigerator car companies on July 1 had 110,431 new freight cars on order. On July 1, 1947, there were 102,634 on order.

New freight cars on order by Class I railroads and railroad-owned private-controlled refrigerator companies on July 1 this year were as follows: 29,701 box including 29,370 plain and ventilated and 331 automobile box cars; 49,287 hopper including 4105 covered hoppers; 19,445 gondolas; 3685 flat; 6866 refrigerator, 600 stock and 847 miscellaneous freight cars.

Of the total number of new freight cars which Class I railroads on July 1 had on order, 23,699 will be built in railroad shops and 86,732 in outside shops.

Class I railroads also had 1,695 locomotives on order on July 1 this year, the most since Aug 1, 1923, when the number was 1772. On July 1, 1947, there were 794 on order. The number for which orders had been placed on July 1, 1948, included 123 steam and 1572 diesel locomotives, compared with 24 steam, five electric and 765 diesel 1 year ago.

Class I railroads and railroad-owned private-controlled refrigerator car companies put 50,918 new freight cars in service in the first 6 months of 1948, compared with 20,735 in the same period in 1947. In the month of June 1948, the railroads installed 9835 new freight cars. This was the greatest number of new freight cars installed in service in any month since April 1942.

Those installed in the 6-month period this year were as follows: 20,905 box cars which included 19,872 plain and ventilated and 1033 automobile; 20,972 hopper including 815 covered hoppers; 5053 gondolas; 3530 refrigerator; 42 flat; 250 stock and 166 miscellaneous freight cars.

They also put 648 new locomotives in service in the first 6 months of 1948 of which 24 were steam, four electric and 620 diesel. New locomotives installed in the same period last year totaled 418, of which 63 were steam, one electric and 354 diesel.

Class I railroads and railroad-owned private-controlled refrigerator car companies in the first 6 months of 1948 retired 36,797 freight cars of which number, 1504 were retired in the month of June. In the same 6-month period of 1947, there were 27,802 retired.

Library Contracted to Do Atomic Research Work

Chicago

• • • **The Atomic Energy** Commission and the John Crerar Library of Chicago, have signed a contract by which the library will do abstracting of scientific books and periodicals necessary to the atomic energy research being done under the sponsorship of the commission. The commission will reimburse the library for all costs.

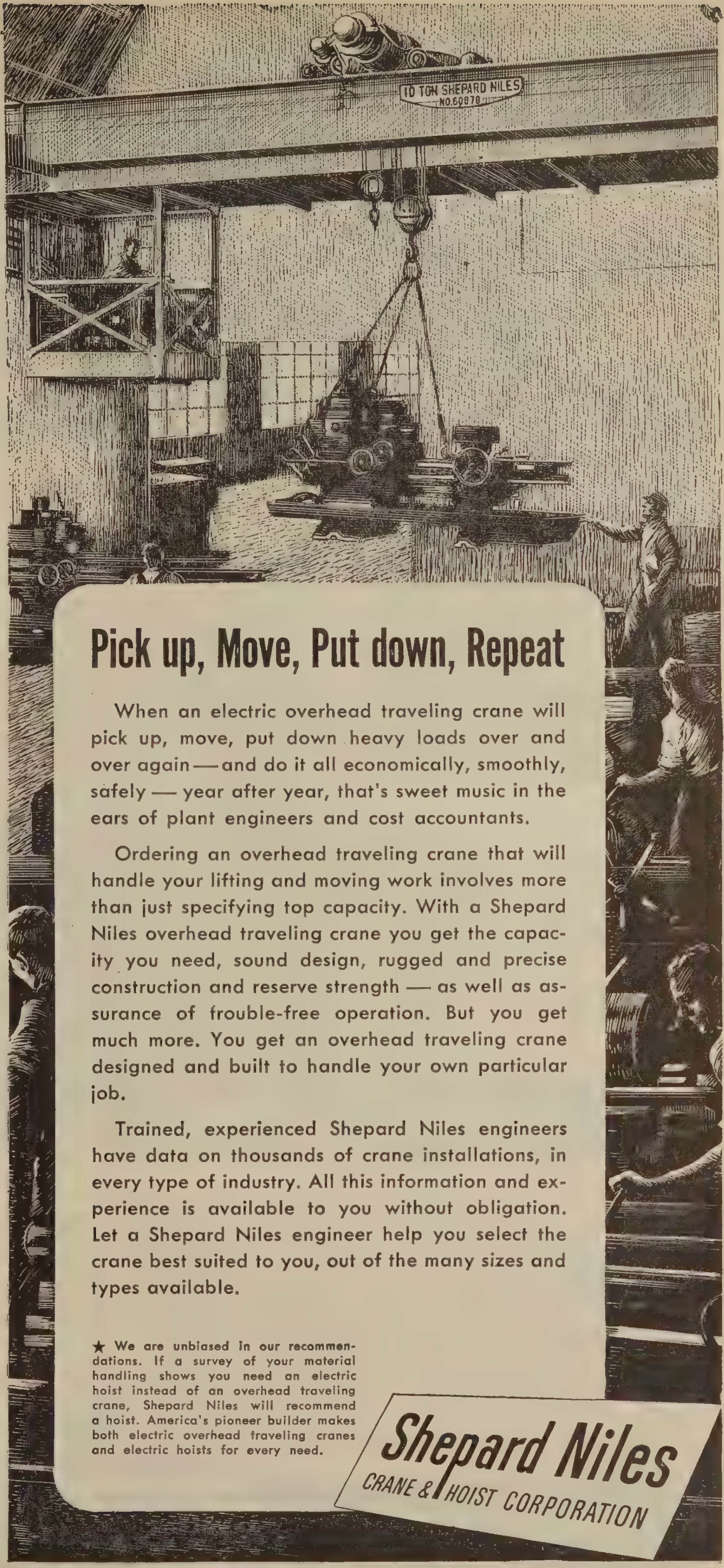
A special staff of experts to be established by the library will study the 3500 scientific periodicals received by the library for material pertinent to atomic energy research, translate it where necessary, abstract it, and make it immediately available to the commission for distribution to its affiliated research laboratories. The staff will also use the 700,000 books in the library in making searches on special subjects submitted by the commission.

Reports on Enamelware

Washington

• • • **Dollar value** of porcelain enameled products shipped during April 1948, showed a decrease of approximately $200,000 from the $5 million figure reported for March 1948, according to the Porcelain Enamel Institute, Washington. The April 1948, total was $159,000 greater than that for April 1947, and $1,512,000 greater than the total for the same month in 1946.

Total value of porcelain enamel products shipped during the first 4 months of this year was $18,925,000, an increase of $1,702,000 over the 1947 total for the same period, and almost double the $9,600,000 value reported for the first 4 months of 1946, the institute report stated. These figures do not include values for cooking, household, and hospital utensils, and for finished plumbing ware.



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When an electric overhead traveling crane will pick up, move, put down heavy loads over and over again—and do it all economically, smoothly, safely — year after year, that's sweet music in the ears of plant engineers and cost accountants.

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Trained, experienced Shepard Niles engineers have data on thousands of crane installations, in every type of industry. All this information and experience is available to you without obligation. Let a Shepard Niles engineer help you select the crane best suited to you, out of the many sizes and types available.

★ We are unbiased in our recommendations. If a survey of your material handling shows you need an electric hoist instead of an overhead traveling crane, Shepard Niles will recommend a hoist. America's pioneer builder makes both electric overhead traveling cranes and electric hoists for every need.

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Navy Rent for Leased Properties Decrease

Washington

• • • **The annual** rental paid b the Navy for leased properties ha been reduced by more than $15 million since V-J Day as a result of th Navy's having cancelled or otherwise disposed of almost 4500 of th 5000 leases held at its wartime peak

Leases in effect on V-J Day wer costing the Navy an annual renta of $16,112,706. Only 825 leases a an annual rental of $910,000 remained in effect on June 30, 1948 according to the Property Administration Div., of the Bureau of Yard and Docks.

Of the 825 leases remaining i effect, approximately 300 are new ones negotiated since V-J Day fo property used by the Naval Reserve

The complicated process of cancelling wartime leases has been carried out by the Bureau of Yards and Docks at a rate of approximately 100 a month since V-J Day. The process involves thorough surveys to determine possible future needs of the Navy for each property, and in many cases, the transfer of certain facilities to permanent Navy stations.

In addition to the Navy leases cancelled, 265 other wartime properties have been declared surplus to the War Assets Administration.

Practice Reaffirmed

Washington

• • • **Simplified Practice** Recommendation R3-44, Metal Lath (Expanded and Sheet) and Metal Plastering Accessories, has been reaffirmed without change, according to an announcement of the Commodity Standards Division of the National Bureau of Standards. This action was taken by vote of the Standing Committee in charge of the recommendation.

The original edition of the recommendation was issued in 1924. The current edition which is the fourth revision, was approved in April 1944. It covers expanded and sheet lath and plastering accessories such as cold-rolled channels, concealed picture mold, metal casings, tie wire and hanger wire. In the opinion of the industry, this recommendation has been found to be a useful aid in reducing the waste of overdiversification.

Modern Diesel Tow Boats Add to Barge Capacity

Chicago

• • • **During the first** six months of 1948, 15 new modern diesel powered tow boats were put into service on the inland waterways system of this country. At least 15 more will be ready for service by the end of the year.

American Waterways Operators Inc. reported the powerful new tow boats can handle as many as 18 to 20 loaded barges, with payload tonnage equal to the total of 150 full railway freight cars in one tow. Chester C. Thompson, president of American Waterway Operators said, "The 15 new tow boats put into service represent a total of approximately 30,000 gross hp. Operators figure that 1 hp in tow boats will push eight tons of cargo in barges, so this means that 240,000 more tons of freight can be transported by the river carriers than was true last fall. It also means that by 1949 the capacity will go up to nearly half a million additional tons of freight."

Smith Named to OIC Post

Washington

• • • **Philip Smith,** scrap expert and official of Joseph Smith & Sons, Inc., of Washington, D. C., has been appointed industry advisor in the Iron and Steel Negotiating Division of the Office of Industry Cooperation.

OIC Director John C. Virden said in announcing the appointment that Mr. Smith would serve as assistant to Alex Miller, OIC's chief industry advisor on scrap.

Mr. Smith is on temporary leave from the firm with which he has been associated for 21 years.

New Group Elects Officers

Chicago

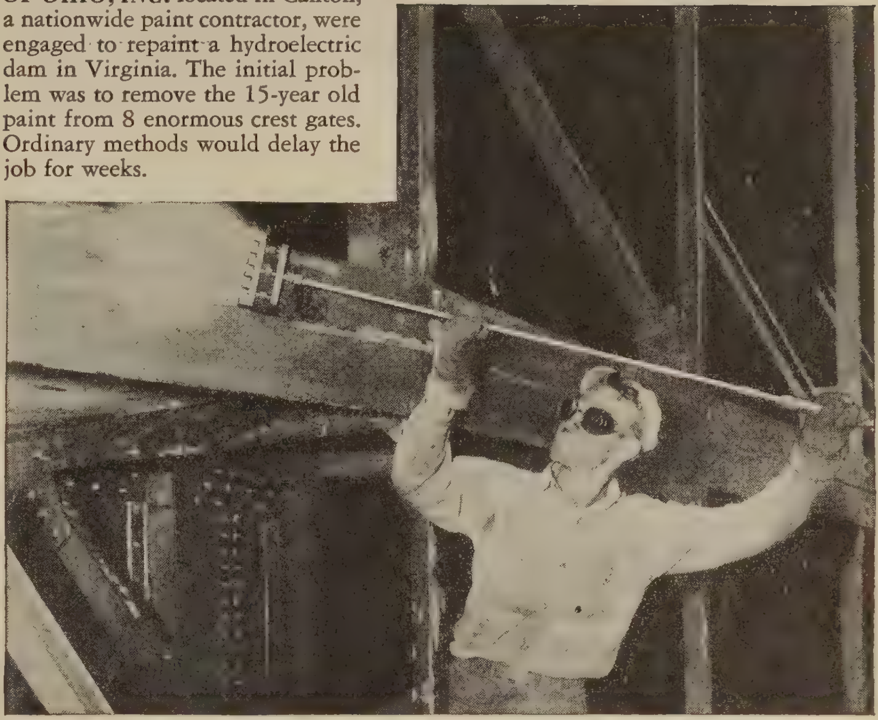
• • • **At a meeting** of gray iron foundrymen in the Chicago area, Edward B. Sherwin, president, Chicago Hardware Co., was elected chairman of a newly organized management executives group of Gray Iron Founders' Society.

R. H. Lehmpuhl, secretary, Sheffield Foundry Co., was named vice-chairman, and Robert F. Grover, Love Brothers, Inc., Aurora, Ill., was made secretary-treasurer.

R. L. Collier, executive vice-president of the society, addressed the meeting.

Flame cleaning speeds 'face lifting' on giant dam

MILLER CONTRACTING CO. OF OHIO, INC. located in Canton, a nationwide paint contractor, were engaged to repaint a hydroelectric dam in Virginia. The initial problem was to remove the 15-year old paint from 8 enormous crest gates. Ordinary methods would delay the job for weeks.



G. E. Hartwick, Airco Technical Sales Representative, suggested oxyacetylene flame cleaning with Series 9200 Torches and Airco Style 120 tips. Quickly and easily applied, the intense heat of the flame cockled the old paint, loosened scale and drove off surface moisture in a single operation.

The Miller Contracting Co. found that a flame cleaned surface made for a better finished paint job. An executive said, "We're convinced that flame cleaning is the most efficient and economical method of preparing steel surfaces prior to painting. We now use it almost exclusively for removing rust and scale."

• • • • •

TECHNICAL SALES SERVICE—ANOTHER AIRCO PLUS-VALUE FOR CUSTOMERS

Technical Sales Service—though not a packaged commodity—is as readily available to all industry as any Airco process or product. If you have a metal working problem, ask to have a Technical Sales Division man call. Address Department 1A 8582, Air Reduction, 60 East 42nd Street, New York 17, N. Y. In Texas: Magnolia Airco Gas Products Co., Houston 1, Texas. On West Coast: Air Reduction Pacific Company, San Francisco 4, California.

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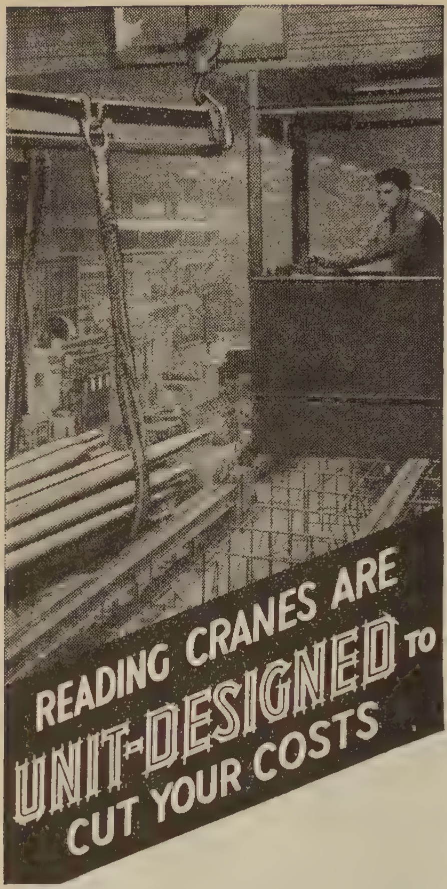

When you have a READING CRANE installed in your plant, you get a crane CUSTOM-BUILT to meet your specific materials handling operation—at no added engineering cost!

Known as UNIT DESIGN, this unique method of crane construction reduces your costs in 2 ways.

❶ LOWERS FIRST COST—Because READING CRANES offer you a choice of several interchangeable motor, control and hoisting units, you buy no "extras" to solve special handling problems.

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See your distributor for information on how you can get a READING CRANE "tailor made" to your own specifications. Drop us a line for your free copy of "The Why and How of Faster Production."

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University of Illinois Has New Testing Device

Chicago

• • • **University of Illinois'** Chicago undergraduate division will use a newly acquired L-type testing device to measure the physical properties of iron, steel, aluminum and bronze. The testing machine is capable of exerting pressures to 300,000 lb.

The school's Navy Pier division is one of the few institutions to take the production of these metals out of the blueprint stage. The Chicago undergraduate division here has melting equipment that includes a 300 lb 3-phase electric arc furnace and a No. 30 crucible gas fired stationary furnace for melting bronze and aluminum.

New shop laboratories of the Navy Pier school now contain 74 precision and production machines including lathes, internal gear cutting, milling, drilling and boring machines and planers and shapers.

Extend Aid for Highways

Washington

• • • **Federal aid** to states for highway construction on a matching basis has been extended for another 2 years under the new Highway Act.

The recently enacted act differs only from the Act of 1944 in that the amount made available was cut from the $500 million annually, as under the previous law, to $450 million.

Also, the sums made available to the individual states may be used within a 2-year period rather than within 1 year as formerly required. However, the 2-year provision was made to apply to fiscal 1948 apportionments of the 1944 act.

Earnings Increase 124 Pct

Toledo

• • • **Willys-Overland** Motors more than doubled their earnings for the first 9 month period of this fiscal year, as compared with the earnings for the corresponding period ending in 1947.

Net earnings for the ¾ mark ending June 30 was $5,216,963.52, an increase of 124 percent over the earnings for that same period a year ago.

This profit is equivalent to $1.75 per common share on a 9 month basis, after an allowance of $499,370.39 for preferred dividends.

U·S·AUTOMATIC CORP.
SCREW MACHINE PARTS

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Amherst, Ohio

Canadian Output of Pig Iron at Record For Monthly Total

Toronto

• • • **Canadian pig iron** production in May was at the highest record in history, totalling 193,305 net tons or 82.9 pct. of rated capacity, and compares with 170,785 tons or 75.7 pct. for April and 160,230 tons or 68.7 pct. for May, 1947. For the month under review output included 156,837 tons of basic iron of which 153,122 tons were for further use of producing companies and 3,715 tons for sale; 21,434 tons of foundry iron of which 836 tons were for further use and 20,598 tons for sale, and 15,034 tons of malleable iron, all for sale.

Throughout May, 12 of the 14 blast furnaces in Canada were blowing. Blast furnace charges included 348,942 tons of iron ore; 33,032 tons of mill cinder, scale, sinter, etc., and 8,281 tons of scrap.

For the five months ended May 31, cumulative production of pig iron totalled 847,930 net tons, compared with 813,327 tons for the like period of 1947 and with 746,133 tons in 1946.

Production of ferro-alloys in May amounted to 18,436 net tons, against 14,474 tons in the previous month and 15,325 tons in May, 1947. Output for the month under review included ferrosilicon, silicomanganese, ferromanganese, ferrochrome, chrom-x and ferrophosphorus. For the five months ending with May output of ferro-alloys totalled 76,151 net tons compared with 61,538 tons in 1947 and 57,307 tons in the 1946 period.

Following are comparative monthly production figures for pig iron and ferro-alloys for 1948 in net tons:

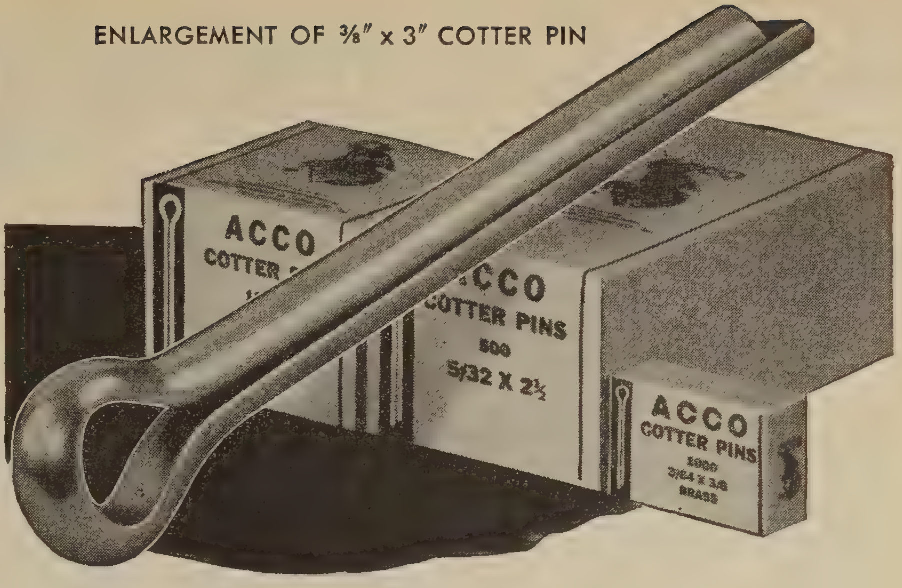
1948	Pig Iron	Ferro-Alloys
January	160,042	17,127
February	151,123	11,823
March	172,675	14,293
April	170,785	14,474
May	193,305	18,436
Total 5 Months	847,930	76,151

Employment Remains Stable

Washington

• • • **Relatively** stable employment during April kept the manufacturing industry hiring rate at around 40 per 1000 employees, according to the Bureau of Labor Statistics. Quits stood at around 30 per 1000 while lay-offs amounted to about 12 per 1000. During the first four months of 1948, layoffs have stood at a consistently higher rate than in 1947.

ENLARGEMENT OF ⅜" x 3" COTTER PIN



ACCO COTTER PINS ARE MADE TO AMERICAN CHAIN STANDARDS OF QUALITY

There's more to a cotter pin than simple dimensions. ACCO cotter pins are precision-made from accurately drawn wire. They are easy to insert. They fit the hole size for which they are made. Prongs spread easily and hold tight. And they are packed in substantial boxes, clearly labeled.

YORK, PA.—American Chain makes two types of cotter pins in a full range of sizes. In addition to the ACCO (regular type, shown above) American offers the CAMPBELL HAMMERLOCK, which locks positively and permanently by simply striking the head with a hammer—a distinct advantage on a production line.

Look to American for sound quality, whether it is cotter pins—electric or fire-welded chain—any type of weldless chain made of formed wire or stampings—chain fittings, attachments and assemblies—repair links—hooks.

Get in touch with your American Chain Distributor.

ACCO

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AMERICAN CHAIN DIVISION
AMERICAN CHAIN & CABLE

TRADE MARK

In Business for Your Safety

Commerce Dept. Sets 4th Quarter Export Quotas for Tinplate

Washington

• • • **Country** export quotas for tinplate for the fourth quarter of 1948 were announced last week by the Dept. of Commerce through its Office of International Trade.

The general overall quota is 113,000 net tons for the third quarter. Approved foreign orders for this quantity of tinplate will be supported by Certified Export Steel (EXS) priority ratings and must be accepted by American tinplate producers, Commerce officials said.

An additional 14,000 tons of tinplate has been designated for an unrated quota. Of this amount, 7000 tons may be sent abroad to package foodstuffs for importation into the United States, and 7000 tons may be used for purposes authorized by Tin Conservation Order M-43, including use by American petroleum companies. Licenses for the latter 7000 tons will be restricted to electrolytic tinplate (maximum—.50 lb coating) or special manufacturing ternes.

The priority rated quotas will be distributed according to the following country quotas:

FOURTH QUARTER 1948
QUOTAS BY COUNTRY

Country	4th Quarter Quota
Argentina	8700
Bolivia	200
Brazil	9450
Chile	2700
Colombia	1000
Costa Rica	23
Cuba	4500
Dominican Republic	150
Ecuador	50
Guatemala	30
Haiti	23
Honduras	20
Mexico	3100
Nicaragua	50
Panama	65
Paraguay	130
Peru	900
El Salvador	23
Uruguay	1100
Venezuela	800
Australia	11500
Austria	650
Belgium	4600
Belgian Congo	125
China	2625
Denmark	2200
Egypt	1100
Ethiopia	20
France	3250
French Possessions:	
Fr. Equatorial Africa	25
Fr. Indo China	300
Fr. North Africa	4000
Fr. West Africa	175
Madagascar	425
New Caledonia	50
Greece	1000
Hong Kong	---
Iceland	120
India	2500
Iran	25
Ireland	350
Israel	450
Italy	1000
Jamaica	25
Japan	1450
Korea	350
Lebanon	100
Netherlands	9800
Netherlands East Indies	1475
Newfoundland	60
New Zealand	1800
Norway	5200
Pakistan	1200
Philippine Islands	1400
Portugal	3700
Portugese West Africa	150
Siam	200
South Africa	7100
Southern Rhodesia	100
Spain	825
Sweden	4000
Switzerland	3350
Syria	50
Trieste	70
Turkey	1000
Contingency	91
Total	113,000

Market Potentials of Argentine Studied by Export Minded British

London

• • • **The British** Iron and Steel Federation has been making a study of the market potential of the Argentine and concludes that even if Argentine's 500,000 tons per annum steel plant is operating within 2 years, as the authorities hope, demand will more than keep pace with production. Import requirements of at least 600,000 tons per annum are likely to continue for some years. The possibilities of expansion, it points out, are illustrated by the growth of population, which rose from 12.7 millions in 1938 to 16 millions in 1947, and by the immigration program, which, according to recent declarations, aims at obtaining 4 million immigrants over the next few years.

The rapid industrialization of Argentina, the intensive development of hydro-electric projects, and the re-equipment and extension of the railways will create an increasing demand for capital goods and steel, including special steels, but more especially structural steel. Argentine private industry rolls fair quantities of joists 3-6 ins., also small angles and tees, but output of heavy channels, flats and angles is nil and no high-grade structural steel is made.

During the period of shortage, the practice of building in reinforced concrete, always applied to dwelling houses and flats, has been extended to bridges, etc., so that in general, although certain sizes of structural steel have run short, local production plus imports has been almost sufficient to meet demand. The 1947 imports of joists totalled 17,000 tons, as compared with 19,765 tons in 1937. Suppliers were mainly U.S.A.

MATERIALS-HANDLING EQUIPMENT
CUTS OPERATING COSTS . . . SPEEDS OUTPUT

KRANE KAR performance is unmatched. Works anywhere — in the plant or yard — tight quarters, low headroom, long hauls, up and down grades. Makes short work of Loading and Unloading freight cars, trucks, trailers . . . Transporting, Stacking, Storing . . . Plant Maintenance and Repairs. Ideal for handling forgings, bars, blooms, billets, ingots, castings, (or scrap when equipped with magnet). Also heavy objects like transmission cases, machine heads, crankcases, motors, etc. Users report labor-savings up to 75% . . . materials handling costs cut to 8c a ton . . . and elimination of hazard of serious injuries commonly experienced in hand methods.*

Gasoline or Diesel. Equipped with pneumatic or solid rubber tires; 9 to 37 ft. booms or adjustable telescopic booms; electric magnet, clamshell bucket, and other accessories available.

USERS: General Motors; Bethlehem Steel; Todd Shipyards; Boeing; General Electric; duPont; Pullman Standard; etc.

* Case studies on request.

KRANE KAR handles loads at Sides as well as at Front.

Ask for illustrated Bulletin No. 79.

THE ORIGINAL SWING-BOOM MOBILE CRANE
WITH FRONT-WHEEL DRIVE AND REAR-WHEEL STEER
1¼, 2½, 5, AND 10 TON CAPACITIES
KRANE KAR
TRADE-MARK REGISTERED
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ON THE ROAD TO FINAL FINISH

How Many Steps are Necessary
TURN
ROUGH GRIND
FINISH GRIND
COARSE LAP
FINISH LAP
BUFF
... and How Do You Know FOR SURE ?

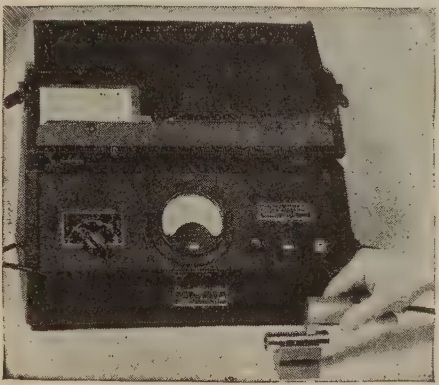
CHANCES ARE that on *any* job, the series of operations by which you obtain final finish was arrived at by the cut-and-try method—primarily because nobody knows for *sure* just what is contributed to final finish by any given step in the series.

This method obviously gives desired results, but often at *unnecessary cost*. For instance—

Time after time, surface roughness measurements made with the Profilometer after each operation prove that some operations contribute *nothing* toward final finish. In fact, many times this instrument shows that some "essential" operation actually makes the surface *rougher* instead of smoother.

The Profilometer will show you clearly and quickly, right at the machine, exacty what microinch finish you're getting at each step. Thus, with the Profilometer, you can eliminate unnecessary operations—gain closer control of each step—get the desired finish *much faster, and at much lower cost.*

In ALL cases where surface finish is a factor, it will pay you to investigate the practical advantages offered only by the Profilometer. Write today for descriptive bulletin—without obligation, of course.



The PROFILOMETER
TRADE NAME REGISTERED

PHYSICISTS RESEARCH COMPANY
ANN ARBOR • MICHIGAN

and Belgium, with smaller tonnages from Luxembourg, Spain and England.

Trade with England is said to have been hampered by export licensing difficulties. Total British iron and steel exports to the Argentine for 1946 and 1947 were 87,000 and 84,000 metric tons respectively, compared with the U.S.A.'s 268,000 and 558,000 metric tons and Belgium's 158,000 and 143,000 metric tons.

The unique complementary nature of Anglo-Argentine trade in pre-war years derived from the British demand for Argentine agricultural products, and in part from the inability of the U.S.A. to absorb additional imports of low-priced Argentine commodities without disrupting her own agrarian economy.

As long as the U.S. ranching and farming interests are firmly opposed to any unrestricted import, it is believed that the Argentine will tend to look to England rather than to the U.S. for a large part of her requirements of capital and consumer goods (including finished steel), and mutual needs will continue to be covered by bilateral agreements designed to restore as far as possible the pre-war situation.

Moreover, resistance to Argentine pressure for the improvement of her dollar position at the expense of the sterling area must necessarily involve a major effort to increase British exports to that country.

New England Industrial Status Better This Year

Boston

• • • **A survey of** New England's industrial status shows that the first half of this year was a little better than the first 6 months of 1947. But the continued uncertainty of steel supplies acted as a drag on the metal working group.

Machine tool manufacturers are generally disappointed with their first half sales which are well below the predictions made at the beginning of the year.

Forging jobbers, particularly those making stampings, have been plagued with lack of material to work with. But collectively they did better this year than during the corresponding period last year.

Auto parts makers have averaged larger output than last year. And this holds true for the majority of the other manufacturers.

General comment on the change to f.o.b. pricing by steel producers is that it will have relatively little effect on the majority of New England industries. Many have virtually been on an f.o.b. basis for some time, including foundries buying pig iron from Mystic Iron Works. The change will, however, have its influence on foundry coke prices which have largely been sold on a delivered price basis.

Releases Annual Report

New York

• • • **Sales and earnings** of the American Car and Foundry Co. and its subsidiaries showed a moderate decline for the fiscal year ending April 30, 1948. However, the backlog of business swelled to a new peacetime high of more than $280 million, it was revealed here in an annual report to the stockholders.

Net earnings of the company and its subsidiaries for the past fiscal year amounted to $4,103,952, equal after preferred dividend requirements to $3.47 per share on the 599,400 shares of common stock outstanding. This compares with $5,176,042, or $5.26 a share, for the fiscal year ending in 1947. Sales totaled $131,360,756 against $132,820,244 for the previous year.

Elected Board Director

New York

• • • **Orville J. Taylor** who recently returned from a mission in Germany as assistant to the Secretary of the Army has been elected to the board of directors of John W. Harris Associates.

Mr. Taylor, a member of the law firm of Taylor, Miller, Busch & Magner, is a member of the Chicago Planning Commission, the Northwestern University Foundation and the Citizens Board of the University of Chicago.

John W. Harris, president of the firm, in a former capacity, supervised the construction of the Board of Trade Building, the Chicago Daily News Building, the Tribune Tower, the Bismark Hotel and office building and the LaSalle-Wacker building.

Paper Read to Scrap Assn.

Washington

• • • **Richard V. Bonomo** of the Schiavone-Bonomo Corp., Jersey City, N. J., read a paper entitled "Scrap Costs Are Going Up, Too" a the midyear meeting of the Institute of Scrap Iron and Steel, Inc held at Atlantic City this week.

Mr. Bonomo analyzed the factors of cost at various types of scrap yards, emphasized the necessity for recognizing sharp increases in all items and urged that all dealers get on a sound basis now.

PERSONALS

(Continued from p. 112)

• **Philip M. Morgan,** president, Morgan Construction Co., Worcester, has been appointed to the Massachusetts Airport Management Board.

• **Harry C. Goodale, Jr.,** has been appointed middle western sales representative, American Swiss File & Tool Co., Elizabeth, N. J. Mr. Goodale will have his headquarters in Detroit. He was formerly associated with Lord-Taber Co. Inc.

• **Dr. Karl T. Benedict** who has served part-time on the medical staff of Norton Co., Worcester, has been appointed medical director to succeed **Dr. W. Irving Clark,** who has retired. **Harlan T. Pierpont, Jr.,** has been appointed sales manager, Refractories Div., succeeding **Robert Kirkpatrick,** who has also retired. Mr. Pierpont was formerly abrasive engineer in Michigan. **Norman V. Crabtree** has been assigned to take over the territory covered by Mr. Pierpont. **Richard H. Merchant,** formerly field engineer in Detroit, has been appointed abrasive engineer and will assume responsibility for Mr. Crabtree's area. **Murner E. Thor** of the Refractories Div. has been appointed refractories engineer covering the Canadian and New England territories with his headquarters in Worcester. **E. A. Fischer** has been transferred to the refractories sales engineering department as sales engineer.

• **Leon R. Ludwig,** manager of the Buffalo divisions of the Westinghouse Electric Corp., has been named general manager of the divisions; Willard D. Ligon, works manager has been promoted to manager of the Buffalo motor division; **Theodore C. Fockler,** assistant works manager, has been named assistant general manager; **Charles E. Albright,** superintendent of production, Motor division, has been made director of production, Buffalo divisions, and **William G. Miller,** assistant to the works manager, has been appointed manager of manufacturing of the Motor divisions.

CANTON
SHEET & PLATE SHEAR
... for cutting bulky scrap

HILL ACME TOOLS FOR INDUSTRY

• The CANTON Sheet & Plate Shear has an extra large jaw opening (24") making it possible to shear a wide range of light bulky scrap which formerly had to be torched or baled. Knives are 48" long. The CANTON Sheet & Plate Shear is shipped completely erected with no parts to assemble and requires no additional foundation Capacity is ¼" x 48"

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"CANTON" DIVISION • Cleveland 2, Ohio

"CANTON" ALLIGATOR SHEARS • PORTABLE FLOOR CRANES • ALSO MANUFACTURERS OF "HILL" GRINDING AND POLISHING MACHINES • HYDRAULIC SURFACE GRINDERS • "ACME" FORGING THREADING • TAPPING MACHINES • "CLEVELAND" KNIVES • SHEAR BLADES

PERSONALS

• **Robert T. Keller,** formerly vice-president of the Marine and Industrial Engine Div., Chrysler Corp., has been named president of that division, succeeding **D. A. Wallace,** who has resigned. Mr. Keller joined the corporation in 1934. Mr. Wallace will remain president of the Chrysler Div. of the Chrysler Corp. and will also serve as vice-president of the Marine and Industrial Engine Div.

• **Alwin F. Franz** has been elected a director of the Colorado Fuel & Iron Corp., Denver. Mr. Franz has been vice-president in charge of operations for the corporation and subsidiary companies.

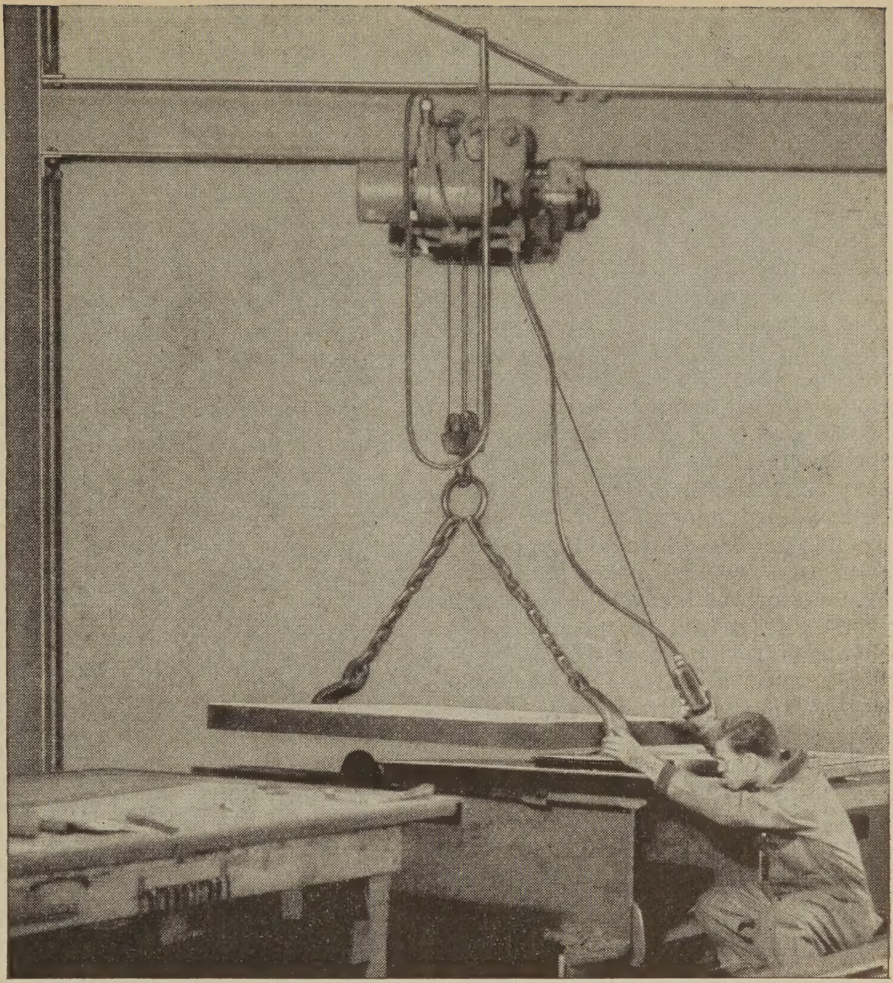
• **Benjamin T. Hain** has resigned as manager of the Bond Plant, American Radiator & Standard Sanitary Corp., and has been named general manager and vice-president in charge of manufacturing, National Radiator Co., Johnstown, Pa.

• **Jerome B. Magee** has been appointed district sales manager in charge of steel boiler sales in western New York, for Farrar & Trefts, Inc., Buffalo, succeeding **John Youngers,** who has resigned. Mr. Magee was formerly connected with Bell Aircraft Corp.

• **Frederick M. Bock** has been named assistant to the president, Pioneer Engineering & Mfg. Co., Detroit. Mr. Bock comes to Pioneer from Burroughs Adding Machine Co.

• **August C. Jacob,** has retired, after 46 years with the Youngstown Sheet & Tube Co., Youngstown. Mr. Jacob joined the company in 1901 as a rigger helper. He became successively, a rigger, general rigger foreman, master mechanic of the steel department, and was appointed assistant superintendent of maintenance in 1940.

• **F. C. Prescott** has been named assistant industrial relations manager and **C. N. Hathway,** assistant labor relations manager, Caterpillar Tractor Co., Peoria, Ill. Mr. Prescott has been associated with the company since 1937 and was connected with the metallurgical laboratory until 1939 when he was transferred to the personnel division. Mr. Hathway has been with Caterpillar since 1935. Later he became supervisor in the planning department and general foreman in the machine shop. Since 1944 he has been an assistant in the labor relations department.



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Slab cutting needs faster, more accurate material handling to save time cost. A NORTHERN ELECTRIC HI-LIFT HOIST will help an operator to load, cut, unload slabs quickly and accurately—save time and avoid delays.

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ELECTRIC CRANES ★
AND HOISTS ★

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PERSONALS

• **A. M. Fleming**, formerly vice-president, has been named president of Pekin Wood Products Div., Chrysler Corp., West Helena, Ark. Mr. Fleming will continue to serve in the capacity of general works manager of the Chrysler Div. He became associated with the corporation in 1924. Later he was made master mechanic of the Kercheval plant and then general works manager of the Chrysler Div. **Carl J. Snyder** has been appointed general manager of the Lynch Road plant of the corporation and **Frank J. Morisette** has been named general staff master mechanic. Mr. Snyder has been associated with Chrysler and its predecessor, the Maxwell Co., for 27 years. He served as master mechanic of Dodge Forge and Dodge Truck Div., and later moved to Dodge-Chicago. Mr. Morisette joined Maxwell in 1923 as chief tool and die designer. He has served as master mechanic at the Jefferson plant, the Dodge main plant and as general staff master mechanic of the corporation.

• **Floyd H. Boyer**, has been named sales representative for the State of Colorado and Laramie County, Wyoming, for Ampco Metal, Inc., Milwaukee.

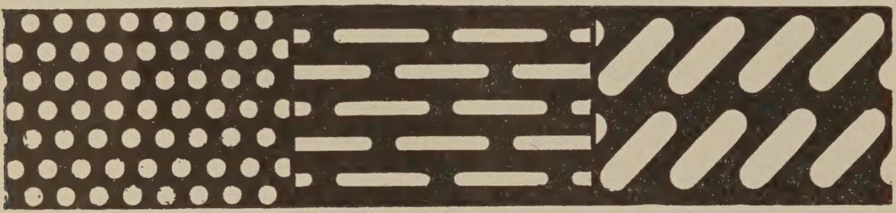
• **G. L. Ferguson** has been assigned as sales engineer to the Atlanta staff of Brown Instrument Co. **Wayne Cook** and **Carl Lower**, service engineers, Baltimore; **Warren N. Smith** and **Albert E. Phillips**, service engineers, Boston; **W. Williamson, Jr.**, service engineer and **R. J. Holt**, sales engineer, Charlotte; **Barnard Fuller** and **Ormond Herring**, sales engineers, Chicago; **R. Schumaker**, sales engineer, Cleveland; **Robert Koening**, service engineer, Denver; **W. DeWolf**, service engineer, Detroit; **Robert Harris, Jr.**, sales engineer, Dallas; **C. D. Walker**, sales engineer, Houston; **Barry Coleman** and **Robert Thomas**, service engineers, Indianapolis; **Richard Corbin**, service, and **Ralph Imbrogno**, sales, Los Angeles; **A. Godfrey**, sales, and **Ernest P. Lang**, **William C. Meyer** and **Edward J. Roach**, service, New York; **A. L. Rogers, Jr.**, sales, and **Albert T. Collins**, **Joseph Facer** and **Edward A. Lytle**, service, Philadelphia; **Keith H. Webb**, service, St. Louis; **Richard Caviniss** and **George Wilson**, service, Syracuse; **John F** **Shea**, service, Washington, D. C. **D. W. Rees**, service, Kansas City **H. C. Klug**, sales, Omaha; **William Harris**, sales, East Orange, N. J.

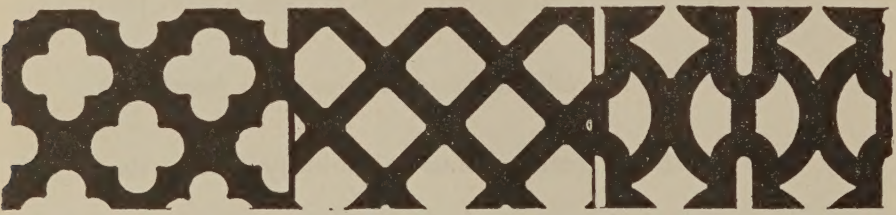
• **Frederick G. Rodenburgh** has retired after nearly 50 years with Pennsylvania Salt Mfg. Co., Philadelphia. He joined the company in 1899 as an assistant in the New York sales office. Later he became sales agent and then New York district sales manager. **Charles A. McCloskey**, formerly Paterson district sales manager, has been appointed district sales manager of the newly-consolidated New York and Paterson, N. J., sales offices. Mr. McCloskey joined Pennsalt in 1929. Later he was named sales representative New York district sales manager and then Paterson district sales manager.

• **Crozier S. Wileman** has been appointed district sales manager, Link-Belt Co., Wilkes-Barre, Pa., succeeding **A. C. Williams**, who has retired after 43 years of service. Mr. Wileman was formerly district sales engineer in the Philadelphia office of the company. **Alton H. Ziegler** has been named Mr. Wileman's assistant. Mr. Ziegler was formerly connected with the Philadelphia district sales office.

• **Leon D. Eldot** has been named coordinator of marketing and sales development for Standard Varnish Works and its subsidiary, Toch Bros., Inc., New York and Chicago. **W. M. Seidel**, manager of the Eastern Div., and **L. H. Jenkins**, manager of the Western Div., have been appointed associates of Mr. Eldot in these activities.

• **Milton Gardner** has been promoted from regional service manager to district sales manager of the St. Louis region, Electro-Motive Div., General Motors Corp. **L. M. Williams**, formerly sales representative in the St. Louis region has been appointed manager of the branch warehouse and service repair shop at Emeryville, Calif. **J. E. O'Leary** has been promoted from assistant regional service manager to regional service manager of the St. Louis region. Other appointments in that region include: **G. C. Smith**, assistant regional service manager; **Guthrie Hill**, district engineer; **E. A. Tucker**, service engineer; **Rene Pommier**, regional parts representative. **O. W. Anglemier** has been appointed service engineer with headquarters at Louisville, a new territory.





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NEWS OF INDUSTRY

- **Henry J. Zimmerman** has been named assistant to the vice-president B. F. Goodrich Co., Akron, Ohio, and assigned to special administrative duties. **Richard W. Corns** has been named to succeed Mr. Zimmerman as general traffic manager. Mr. Zimmerman became associated with the company in 1900. Mr. Corns joined the firm in 1934 as a sales analyst and was later transferred to the traffic department.

OBITUARIES

- **Harry Diamond,** 48, chief of the Electronics Div., National Bureau of Standards, Washington, D. C., died June 21.
- **Donald G. Noakes,** 48, sales manager, Chicago Mfg. Div., Revere Copper & Brass Inc., Chicago, died July 10.
- **Henry Faurot,** 83, president, Western Felt Works, Chicago, died June 1.
- **John Allison,** Chief Engineer, Pittsburgh Steel Foundry Corp., Glassport, Pa., died July 8.
- **John J. Hursh,** 58, assistant manager, commercial research and industrial development department, Bethlehem Steel Co., Bethlehem, died July 8.
- **Albert G. Bladholm,** president, Iron & Steel Products Co., Chicago, died July 6.
- **George W. Walker,** director of purchases, Lincoln-Mercury Div., Ford Motor Co., Dearborn, Mich., died recently.
- **Louis E. Emerman,** 56, chairman of the board of Emerman Machinery Corp., Chicago died July 10.
- **Harry P. Wilson,** vice president and secretary, Providence Steel & Iron Co., Providence, died July 13.
- **Dr. Rolland C. Allen,** 67, executive vice-president, Oglebay, Norton & Co., Cleveland, died July 18.
- **Theodore Jacobson,** 64, former factory manager and consultant engineer for SKF Industries, Inc., Philadelphia, died July 15.
- **J. Halsey McKown,** retired assistant vice president of sales, U. S. Steel Corp. of Delaware, died July 10.
- **Joseph V. Rafferty,** 60, president of Rafferty-Brown Steel Co., Inc., Long Meadow, Mass., died July 19.
- **Wallace Blanchard,** 56, treasurer, Stahleker Steel Corp., Cambridge, Mass., died July 19.

A World of Information about CERIUM
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In One Convenient File Folder

The latest addition to our CERIUM *Data File is H. Morrogh's* NODULAR GRAPHITE STRUCTURES PRODUCED IN GRAY CAST IRONS describing the use of CERIUM as a desulphurizer and carbide stabilizer in the production of nodular graphite structures.

This informative article is yours on request. The *complete* CERIUM Data File contains, in reference form, most of the known facts about the influence of CERIUM on ferrous and non-ferrous metals. Ask for your copy.

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654 MADISON AVE., NEW YORK CITY

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WITHOUT SHOWING WEAR ON TRAVEL GEARS

BROWNING'S rugged, simple construction shows up on this job of traveling, switching and handling heavy stone blocks over 27 miles of the roughest kind of track.

Whatever your operation, The Browning Diesel is the Locomotive Crane that will stand up year after year under the toughest kind of punishment—and save you repair expense, and delays.

Bulletin No. 114718 describes new Browning features of design, construction and operation. Write for it today.

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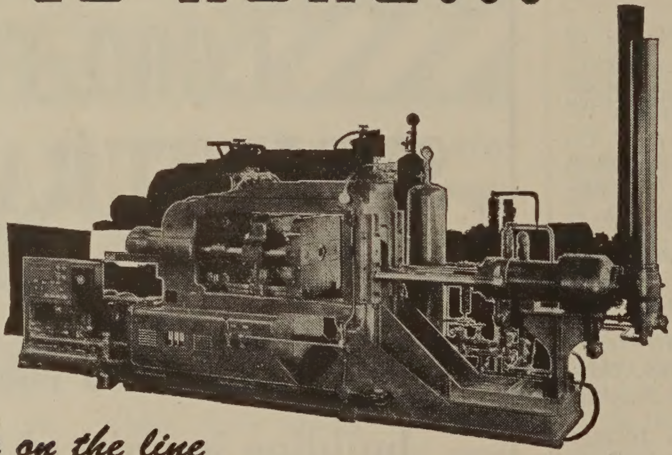
LOCOMOTIVE, WAGON, TRUCK and TU-CONTROL *Cranes*

2nd to none...



But a second Lester on the line

Lester-Phoenix die casting machines are second to none—and almost one third of the companies using our equipment have given us one of the soundest reasons for making this statement—by putting another Lester on the line beside their first. One of these companies is The Hoover Company of North Canton, Ohio where 3 Lester-Phoenix machines are now in operation. Both the aluminum-magnesium-brass type (with the famous, unique pre-fill) and the tin-lead-zinc type have received this industry-wide acceptance. Write for complete specifications.

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